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ELECTRIC RAILWAY JOURNAL

MATERIAL: The finest that has ever been possible in steel wheels.

DESIGN: Weight-saving, cool-running, shock-proof, silent, and lithe-looking. **MOUNTING:** Positive-locking, single and dual, with stresses distributed instead of concentrated.

CONVENIENCE: Easily handled, easily cleaned all over, and easily inflated. **REPUTATION:** Sponsored by the world's largest wheel builders,

Spoksteel wheels assure great progress in making buses more economical, safer and more inviting.

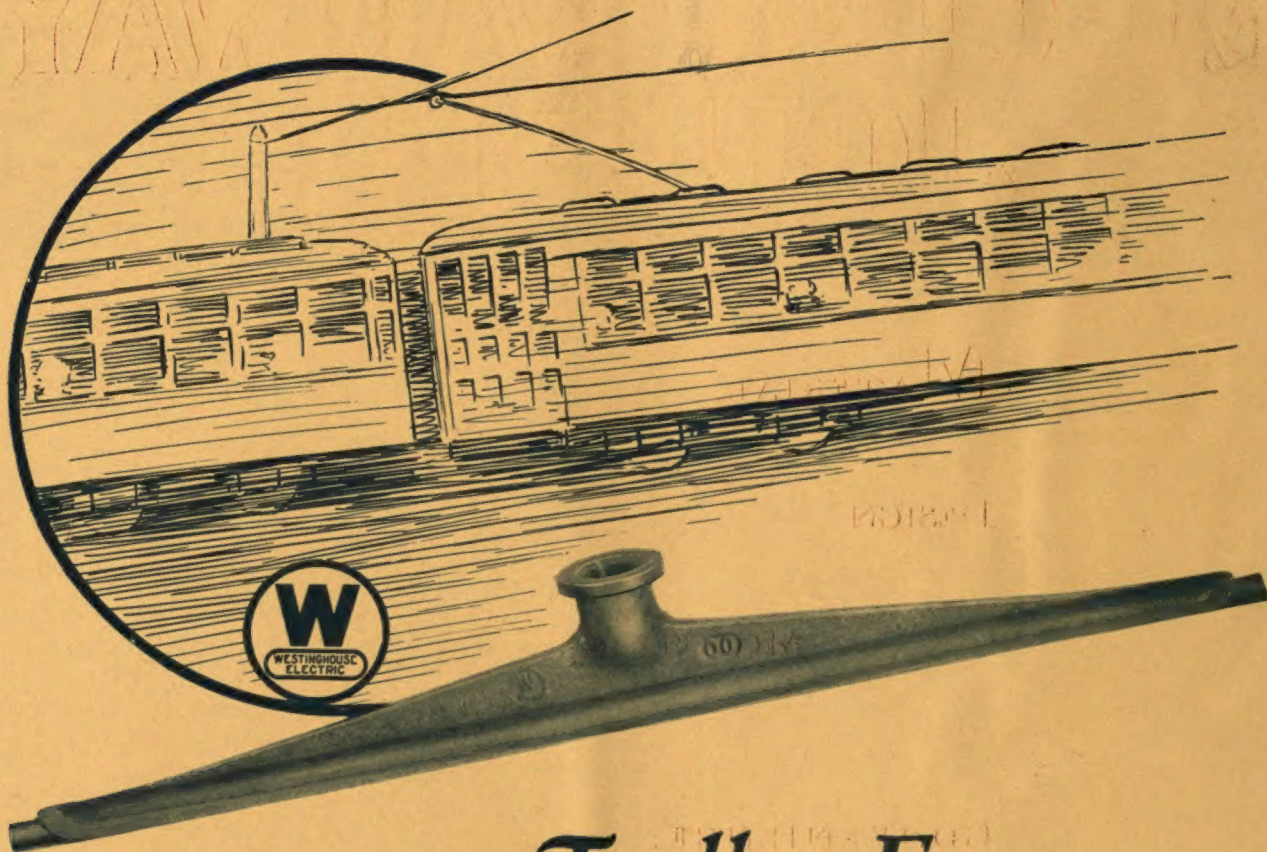
MOTOR WHEEL CORPORATION, LANSING, MICH.

HOUSTON PUBLIC
LYCEUM AND
HOUSTON, TEXAS

Spoksteel

Motor Wheel





with Trolley Ears Backbone

IT'S the ear that holds up the line—or doesn't; that resists the burning of heavy loads—or doesn't; it all depends on the kind of ear—just as the staying power of a man under hard going depends on his *backbone*.

Starting under heavy load—crowded cars accelerating on steep grades—heavy traffic stretches: for these and other extremes of trolley operation, Westinghouse trolley ears are built to withstand punishment. Their performance invariably merits the extra degree of confidence they have earned.

Westinghouse Electric & Manufacturing Company
East Pittsburgh Pennsylvania

Sales Offices in All Principal Cities of
the United States and Foreign Countries



1926

Westinghouse

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Vol. 68
No. 19

CONTENTS

Pages
833-870

NOVEMBER 6, 1926

Editorials	833
Illinois Traction Checks Passenger Decline with Improved Equipment and Service.....	837
More attractive equipment, faster schedules, more frequent service and intensive merchandising effort show recovery of passenger receipts in the face of severe automobile competition.	
Employee Savings Made Easy by Northern Texas Traction	840
Rear Awning Protects Bus Passengers.....	840
Elaborate Safety Precautions in Baltimore.....	841
Efforts are addressed to public and employees, and a number of new methods have been put in operation this year. They include distinguishing straps for car greasers, new rule book, expansion of safety courses, lighting of waiting areas on streets, etc.	
Baltimore Provides Parking Space for Automobilists	846
Modern Storeroom Increases Efficiency.....	846
New facilities and material handling methods on Illinois Traction System cut waste. Printing and reclamation department add to saving.	
Private Weather Station Established.....	848
Acting to supplement the information given by the government bureau, it has helped greatly in predicting storms in Baltimore. The station issues daily bulletins.	
Co-ordinated Bus Service Makes Profit.....	849
The bus service given by the United Railway & Electric Company in Baltimore includes lines which transfer with the cars and lines which do not, sightseeing trips, extended tours and chartered buses. The chartering business is considered the most profitable.	
Light Regulates Heating in Cars.....	851
Interstate Railway Adopts Symbol.....	851
Railway Employees Build Garage.....	851
Prompt Daily Reports Guide Operations.....	852
Substantial Schedule Signs Used at El Paso.....	852
Maintenance Notes	853
Safe Methods of Splicing Armature Leads.....	853
Tension Device for Winding Small Armature Coils.....	853
Wooden Protective Blanket for Armatures	853
Overhead Maintenance Kinks in Baltimore.....	854
New Equipment Available	855
Double Cap-Nut Method for Mounting Dual Wheels.....	855
Face Grinder for Frogs	855
News of the Industry.....	856
Recent Bus Developments.....	861
Financial and Corporate.....	863
Legal Notes	865
Personal Mention	866
Manufactures and the Markets.....	868

Every Road a Subscriber

A CHECK of the registrations at the recent Cleveland convention shows that every electric railway which was represented there by one or more men is a subscriber to ELECTRIC RAILWAY JOURNAL.

Seldom has there been more effective evidence of the extent to which the JOURNAL reaches those who determine electric railway policies. This was the largest and most enthusiastic convention ever held by the industry. Registration figures exceeded all previous records. Delegates from electric railways in every section of the country, and from foreign lands as well, were there.

It is indeed significant that the JOURNAL reaches regularly every property represented in such an epoch-making gathering as this.

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Journal of Electricity
(Published in San Francisco)
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(Published in London)

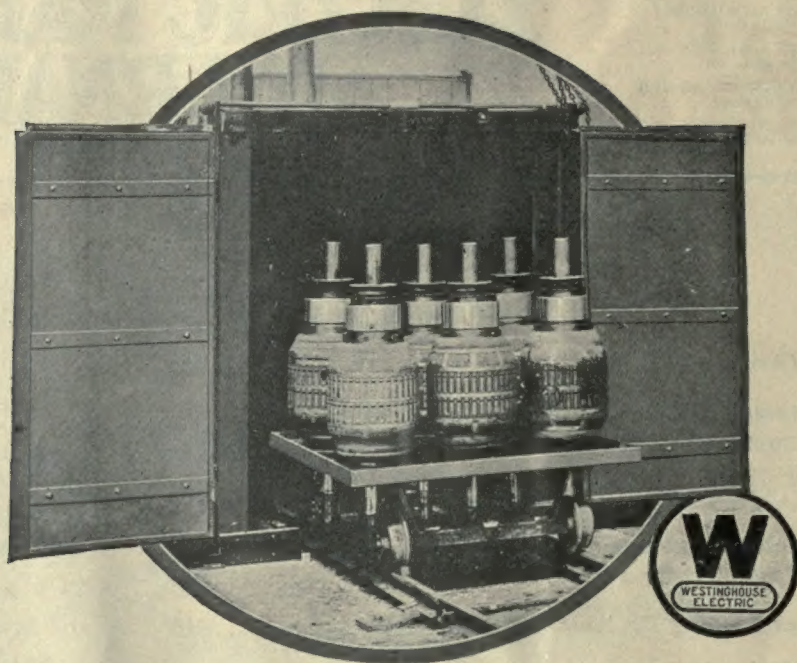


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*Dipped
and Baked*

READY

—for Long, Hard Service



AN armature properly dipped and baked has a hard protective coating impervious to dirt and moisture. All cracks and crevices are filled, all loose coils and laminations held in place.

Proper baking requires just the right temperature. Too much heat burns the insulation; too little heat leaves the armature wet or under-baked. In Westinghouse electric ovens a thermostat automatically controls the temperature within close limits and, as the temperature is uniform throughout the oven, all of the heating space can be utilized.

At your request our nearest office will send Leaflet 1819-A, describing Westinghouse electric armature-baking ovens.

Westinghouse Electric & Manufacturing Company
Industrial Heating Apparatus, Mansfield, Ohio
Sales Offices in All Principal Cities of
the United States and Foreign Countries



Westinghouse
Electric Armature-Baking Ovens

X88873

Famous for Service—the Big 4



Marathon Trolley Ears

SHEER MERIT, demonstrated by unrivaled records of service—in some instances 420,000 car passes and over—has made O-B Marathon Trolley Ears the choice of Line Superintendents on every property where used.

Besides giving from two to three times the service formerly expected of trolley ears, O-B Marathons eliminate wire wear under the ears and materially reduce the number of line breaks. Every Marathon on the line means money saved.



Type N Lock Hanger

THOUSANDS of O-B Type "N" Lock Hangers in service on many properties have demonstrated the dollars and cents value of its special steel spring washer construction. A permanently tight joint between hanger and ear is made by simply

screwing the ear onto the hanger stud. No backing off of the ear is necessary to secure alignment with the trolley wire. This eliminates trouble and rapid depreciation—insures greatly increased service.



BC Frog

CLOSE to half a million car passes is the average reported by five properties using O-B Type "BC" Trolley Frogs. Many individual "BC" Frogs gave even longer service; one lasted for 652,500 car passes before it was replaced.

The big reason for long life is the close coupled center construction, which permits the trolley wheel to ride on its groove from end to end. There is no wear on the pan. This frog can be placed farther out of the curve, reducing wire wear.



C Splicer

THE PREFERENCE shown by scores of Line Superintendents for the Type "C" Splicer has made it the largest seller in the O-B line of Splicers. Repeat orders have come from every property on which it has been used.

Its narrow cross section, low center of gravity, strength and durability of the metal, combine in giving a permanently straight, smooth under-run. All of which means long, trouble-free service. Wire enters in a straight line. Easily installed.

Ohio Brass Company, Mansfield, Ohio
Dominion Insulator & Mfg. Co., Limited
Niagara Falls, Canada

2208

Ohio Brass Co.



PORCELAIN
INSULATORS
LINE MATERIALS
RAIL BONDS
CAR EQUIPMENT
MINING
MATERIALS
VALVES

SAVING THE RAIL SAVES THE RAILWAY

Modern track for modern cars

Light weight cars may reduce track costs, but only good track will reduce car costs.

You don't gain a thing by running fine new light-weight cars over corrugated track, cupped joints and battered special work. It costs less to maintain the track than to maintain cars run on track that isn't in good shape.

Modern track is well maintained track. Good rail maintenance saves cars and the whole track structure. Modern track maintenance is easy and economical with these modern grinders and arc welders.

Have you bulletins? Have you quotations? Hurry? Wire! Or phone.

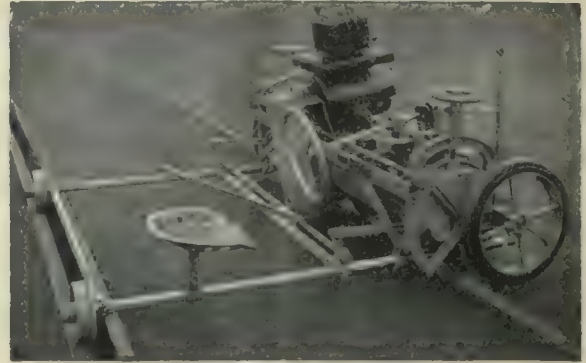
Railway Trackwork Co.

3132-48 East Thompson Street, Philadelphia

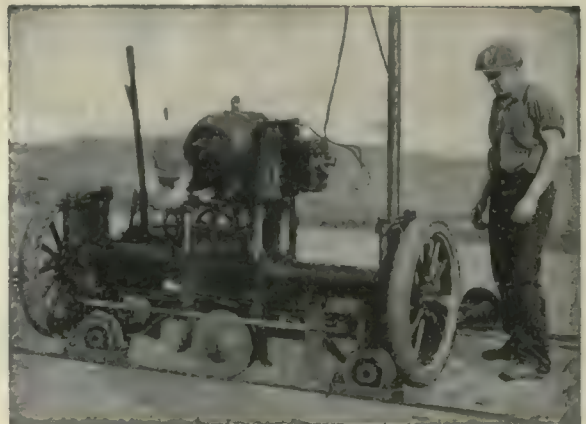
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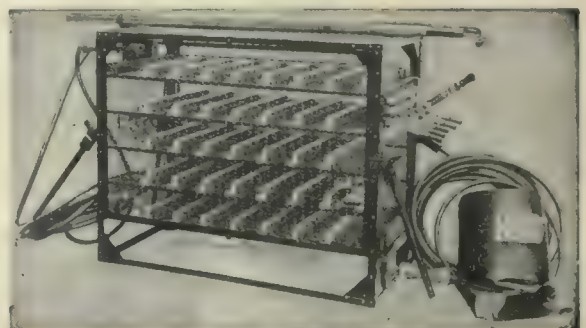
"Improved Atlas" Rail Grinder



"Imperial" Track Grinder



Reciprocating Track Grinder



"Ajax" Electric Arc Welder

SAVING THE RAIL SAVES THE RAILWAY



“Perishable materials are sometimes utilized in the construction of track, in the effort to secure flexibility, and *the life of the track is shortened to that of the perishable material*”*

THIS simple idea is one of the fundamentals of Twin Tie construction. The combination of steel and concrete provides a uniform structure in which no part limits, by its shorter life, the life of the whole.

When steel, well proportioned, provides large bearing surfaces, tie members, and reinforcement for the concrete foundation of such construction, the life of the rail becomes the limiting factor in the life of your track.

Initial costs of twin tie construction are very low. Detailed figures from many jobs are available for comparison with your estimate and costs.—Write for them today.

*Quotation from a paper, “Modern City Track,” read by Nelson R. Love, Chief Engineer of The Denver Tramway Corporation, at the Mid-West Electric Railway Association Meeting at Denver, July, 1926. We will be pleased to mail a copy of the complete article to those interested.

The International Steel Tie Co.
Cleveland, Ohio

Steel Twin Tie Track

Renewable Track . . . Permanent Foundation



Engineering Triumphs

WHEN the architects of ancient days discovered the strength and permanence of stone arch construction they built structures which knew not maintenance problems.

Something akin to the success of the ancient builders has been achieved by the manufacturers and the users of Davis "One-Wear" Steel Wheels.

One life, and that a longer one, without the losses and delays for contour reconditioning is the story in brief. Davis "One-Wear" Steel Wheels make high mileage without requiring maintenance.

Their performance results from a special composition steel that is heat-treated to develop qualities that no other wheel possesses—qualities that are essential for a practical "One-Wear" Wheel.

AMERICAN STEEL FOUNDRIES

NEW YORK

CHICAGO

ST. LOUIS



Illinois Central Electrified Service

—a blaze of Golden Glow light

Daylight safety in night operation!—provided by Golden Glow Headlights. Their powerful penetrating, non-dazzling light dispels the darkness of night along the right-of-way—a veritable blaze of golden glow light.

Other significant points of the Illinois Central Railroad's new electric cars are the Hunter-Keystone Signs to indicate routes and destinations—and the Faraday Car Signals to provide convenient reliable communication between trainmen and motormen.

To find out why Keystone Car Equipment becomes more popular every year—send for ESSCO Catalog No. 7.



Type RA-128 Golden Glow Headlights are designed for heavy electric railway multiple unit trains—shaped to conform to the curve of the car roof; equipped with the special Golden Glow reflector. Send for our Bulletin No. 221.

**Illinois Central uses
other Keystone Equipment**

HUNTER-KEYSTONE Destination Signs

Now accepted almost universally as the standard sign for indicating routes and destinations, this choice is in line with the best current practice.

FARADAY Signals

Installed to afford convenient and reliable means of communication between trainmen and motormen, Faraday Buzzers and Push Buttons put the finishing touches of perfection on this high-grade rolling stock.

ELECTRIC SERVICE SUPPLIES Co.

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General Motors Building

Lyman Tube & Supply Co., Ltd., Montreal, Toronto, Vancouver



Safeguarding the fair and fare

Car riders and car revenue both need protection.

Efficient transportation service demands that traction companies make their cars safe and make them save. You can make your modern cars **SAFE** by interlocking the control, brakes and doors. You can make them **SAVE** by thus centralizing operating responsibility in one man whose duties are properly safeguarded and simplified by complete protective and labor-saving devices.

We make the Safety Car
Control Equipment
which makes the Safety
Car.

Safety Car Control Equipment assures that the fair can go safer and the fare go farther.



SAFETY CAR DEVICES CO.
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**Dayton
Ties
After 15 Years**

Maintenance~
Nothing



The Dayton Mechanical Tie Co.
DAYTON, OHIO



Think of what Dayton No-Maintenance Track would Mean to Your Property

It is 15 years since the first Dayton Mechanical Ties were laid—the first ones are still in service.

From one trial installation have come hundreds, and in none of them has there ever been one penny maintenance.

A wonderful record, and it is getting better every year, for the first ties laid show no signs of giving up. The track is smooth and perfect. May this not mean *permanent* track?

The slash in track maintenance isn't the only advantage of Dayton Ties—

Permanently smooth track also fractionates rolling stock repairs, and encourages patronage.

There is a Dayton Tie Installation near you. Write today, and we'll tell you where it is. Then you can see for yourself.

**Dayton Ties
Put Shock
Absorbers
Under Your
Tracks**

The Dayton Mechanical Tie Co.
DAYTON, OHIO



Winnipeg Electric Co. Car

ON 99 of these Winnipeg cars, as on cars and buses in a half a hundred other cities, the National Pneumatic Automatic Treadle Door is used in order to achieve the circulating load in one-man service.

The Treadle Is an Automatic Exit



—which enables passengers to enter at the front and exit at the rear as quickly and as safely as though you had a man on duty on both platforms. It makes it possible, in short, to handle your peak load with one-man cars yet with no sacrifice whatever in your operating speed nor in the comfort and the safety of your patrons.

National Pneumatic Company

Executive Office, 50 Church Street, New York

General Works, Rahway, New Jersey

CHICAGO
518 McCormick Building

MANUFACTURED IN
TORONTO, CANADA, BY
Railway & Power Engineering Corp., Ltd

PHILADELPHIA
1010 Colonial Trust Building

American BROWN BOVERI

6. Low Weight afford.

Another important advantage in favor of the mercury-arc rectifier is that no special foundations for vibratory loads are required. The only consideration in this respect is that the floor be level and sufficient to support the dead weight. (Only 200 lb. per sq. ft.)

The floor space usually occupied by a rectifier unit is comparable with that required for rotary converters for direct current voltages up to about 600 volts, but where higher voltages are concerned it is invariably less.

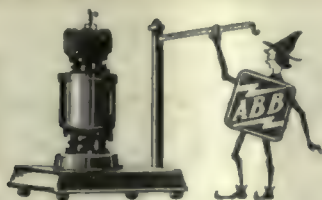
*steel enclosed—
no glass parts*

Principal Products

Mercury-Arc Power Rectifiers
(steel enclosed)
Electric Locomotives—for any
system of current, high or
low tensions
Complete equipment for rail-
way electrification
Rotary Converters
Motor Generators
Diesel-Electric Locomotives

Mining Locomotives
Switches, Controllers and all
Auxiliary Equipment
Steam Turbo Generators for
normal or high pressures
and superheats
Automatic Regulators
Oil Switches
Condensers and Auxiliaries

Relays
Turbo Compressors and Blowers
Electric Furnaces
Induction Regulators
Ships
Diesel Driven
Turbine Driven
Electrical Driven
Structural Steel Fabrication



Mercury-Arc Power Rectifiers

construction economies!

Chief Advantages

- (1) Efficiency high over the whole working range.
- (2) Simple operation and minimum attention.
- (3) No synchronizing.
- (4) Very high momentary overload capacity and insensibility to short circuits.
- (5) Negligible maintenance.
- (6) Low weight. No special foundations.
- (7) Noiseless and vibrationless operation, consequently rectifier substations can be erected in densely populated localities.
- (8) New sub-stations need only be of light construction. In many cases old houses can be converted, while the plant can often be erected in places that could not be considered for rotating machinery.

Descriptive Circular No. 301
describes ABB Mercury-Arc
Power Rectifiers.

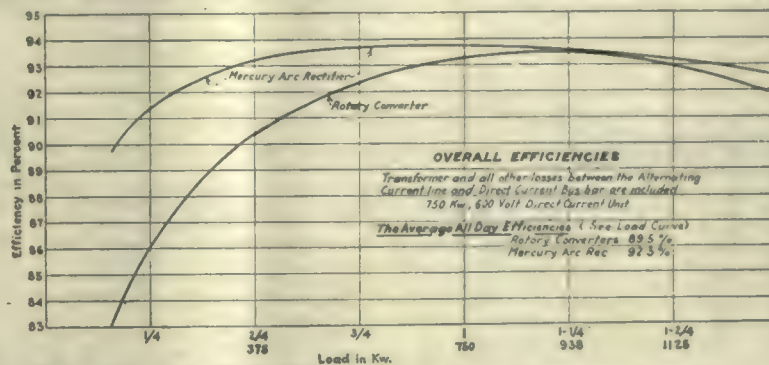
With a BROWN BOVERI MERCURY ARC RECTIFIER, characterized by unusually high efficiency at partial loads, the Average Converting Losses are, at extremely Low Load Factor, cut down tremendously, even at Rail Voltages as low as 400 V.

Below is shown what can be done in an Actual Case by the use of Mercury Arc Rectifiers. The reference is to an Inter-urban Railroad in one of the Eastern States. The substation

rating is 750 Kw.-H., 600 V. The part of a record roll reproduced on this page shows the usual output over a period of six hours.

The AVERAGE ALL DAY OVERALL EFFICIENCY was found to be:

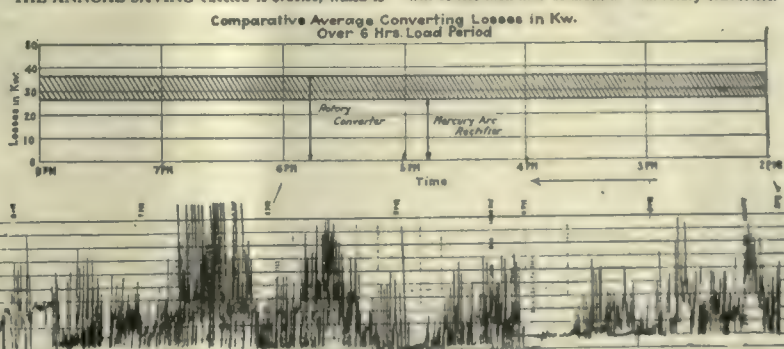
for Rotary Converters..... 89.5%
for Mercury Arc Rectifiers..... 92.3%



The saving obtained in six hours (represented by the shaded area) when extended over a 20-hr. day, amounts to MORE THAN 200 KW.-H., or, at 1c. per Kw.-H., THE ANNUAL SAVING effected is \$730.00, which is

the INTEREST ON MORE THAN \$10,000.00.

In addition to the power saving, the maintenance cost will be less than half as much as with rotary converters.



American Brown Boveri Electric Corporation

165 Broadway, New York, N. Y.

Camden, New Jersey

922 Witherspoon Bldg., Philadelphia 842 Summer Street, Boston 230 South Clark Street, Chicago



1926

AMERICAN BROWN BOVERI

Safeguard and Accelerate Traffic

Automatic Signals by providing proper spacing of cars or trains, reduce trip time and enable more cars to be operated with consequent safety.

Interlocking installations at terminals and at grade crossings eliminate unnecessary stops and assure route continuity by means of signal indications.

Highway crossing protective devices of the flashing light, automatic flagman, or audible type, or combination of same, are a dependable insurance which soon pays off the investment.

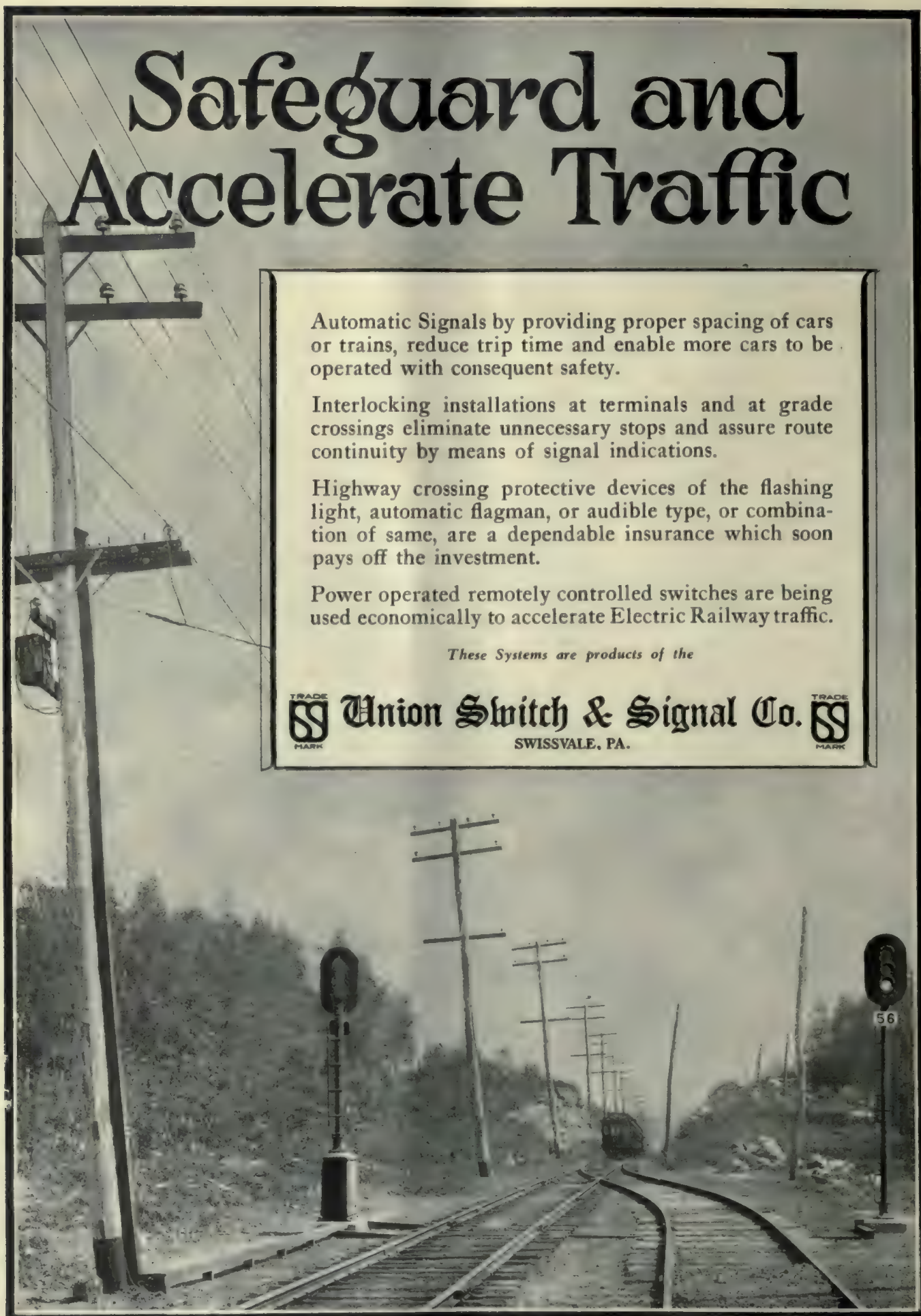
Power operated remotely controlled switches are being used economically to accelerate Electric Railway traffic.

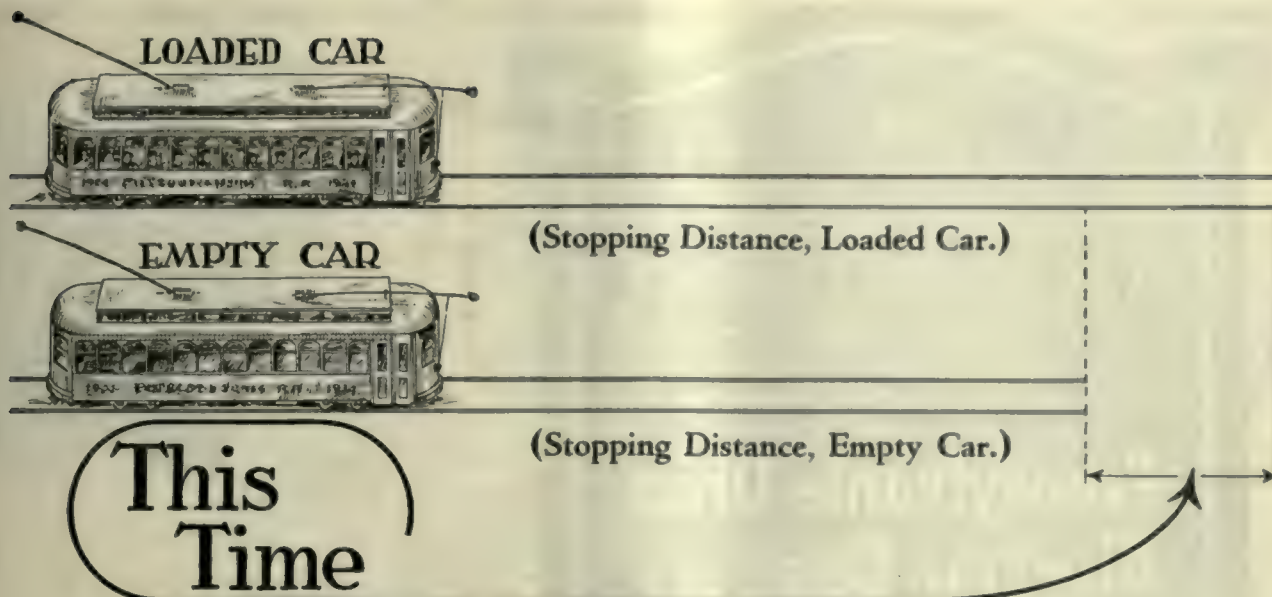
These Systems are products of the



Union Switch & Signal Co.

SWISSVALE, PA.





This Time Can be Saved

WITH the ordinary form of air brake equipment the maximum retarding force is limited to that which is ample and permissible for an empty car, but which is inadequate to effect the proper degree of control on a loaded car—particularly if it has a high ratio of loaded to light weight—with the result that the stop is lengthened and more time is consumed.

But this time can be saved!

The Westinghouse Variable Load Brake, adapted specifically for modern light weight surface cars, eliminates the difference in retarding effect on empty and loaded cars—by an automatic adjustment of brake cylinder pressure with the changing load—and insures that stops will be as short under all conditions as would normally be possible only with an empty car.

The saving in time, effected by the uniformly shorter stops, is translated into faster schedule speeds just when time is most valuable—during those periods when there is a demand for quick transportation of large volumes of revenue-producing traffic.

Mass transportation can be accelerated to increase the profit and popularity of your service by the use of this modern brake on your modern cars.



WESTINGHOUSE TRACTION BRAKE CO.
General Office and Works, WILMERDING, PA.

WESTINGHOUSE TRACTION BRAKES

Information regarding Westinghouse Variable Load Brakes may be obtained upon application to our nearest district office — Ask for Descriptive Catalogue T-2045.



Coffin Award Winners employ

The brief filed by the Pennsylvania-Ohio Electric Company, winner of the 1926 Coffin Award, gives credit to Thermit for improving track conditions, and for prolonging its useful life. This is only part of the story. Two years ago, the engineer of way of the Youngstown Municipal Railway, now engineer of the Pennsylvania-Ohio Electric, published the article shown here, dealing with the very excellent results obtained by the use of Thermit.

But the latest Coffin Award is only one instance of Thermit's association with the leaders in the electric railway field. As a matter of fact, three out of four winners of this award are Thermit users. This year the Pennsylvania-Ohio Electric Company, last year the Pittsburgh Railways, and in 1923 the Chicago, North Shore & Milwaukee R.R. Each have used the Thermit joint as standard for many years.

Thermit welding makes a solid rail where most other processes make



METAL & THERMIT

PITTSBURGH

CHICAGO

BOSTON

120 BROADWAY

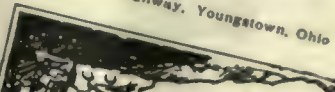
Thermit Process Gives Good Results in Youngstown

This Method Is Used in the Installation and Repair of Crossings, Switches and Mates, Compromise Joints and Other Special Work—It Has Been the Standard of the Company Since 1916

By D. J. Graham

Engineer of Maintenance of Way Youngstown Municipal Railway, Youngstown, Ohio

DURING the past eight years, approximately 8,000 thermit-welded joints have been installed by the Youngstown Municipal Railway and to date only seven joints have failed. From investigation of the failures it was found that in most cases the break was due to faulty pouring, improper preheating of rails, or neglect in setting the mold boxes in the center of weld. In 1916 thermit-welded joints were adopted as standard practice for all types of new track construction.



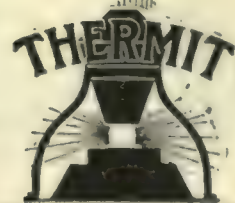
Thermit for best results!

a joint. There is no gap. Grinding levels off the surface once and for all. The possibility of trouble at a Thermit weld is no greater than anywhere else along the rail.

And moreover, the Pennsylvania-Ohio Electric Company has found that one of the major advantages of Thermit welding is that it permits the use of 103 lb. rail for new trackwork in place of 134 lb. rail formerly used. Joints, formerly the weak spot in light rail construction, are entirely eliminated by Thermit, and become as strong as the rail itself.

Thermit Welding has been made easier and more simple than the average welded joint process. It costs no more but gives a more perfect result.

Many other electric railways confirm the findings of the Coffin winners.



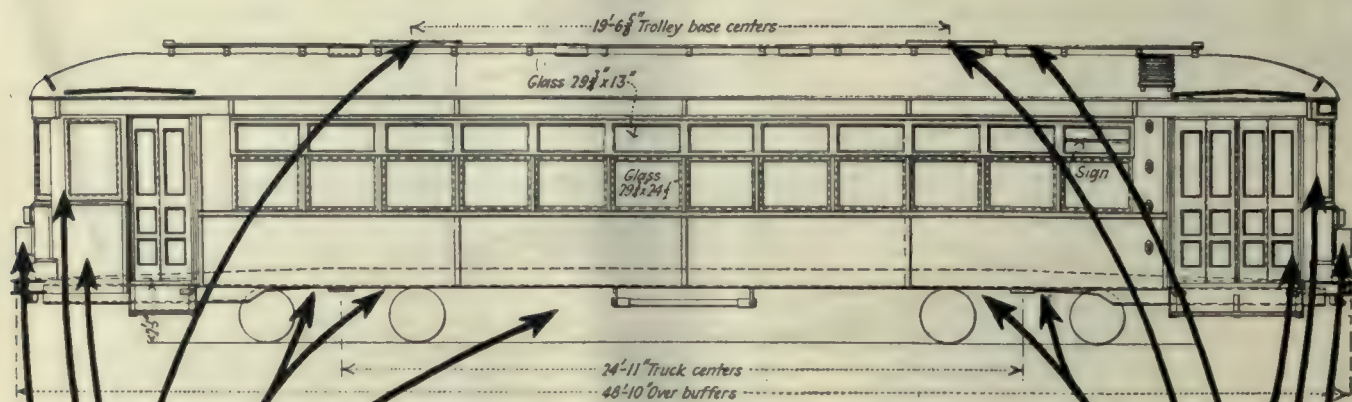
CORPORATION

NEW YORK, N.Y.

SOUTH SAN FRANCISCO

TORONTO

Pittsfield to have the first A.E.R.A. Specification Cars



which will be equipped with

G-E CP 27 Compressor
 G-E 265 A Motors
 G-E Air Brakes
 G-E K-35 KK Control
 G-E Headlights
 G-E US 20A Trolley Base
 G-E Lightning Arresters



Twelve interurban units, now being built for the Berkshire Street Railway, Pittsfield, Mass., are the first to follow the specifications set by the A.E.R.A. committee on the essential features of modern cars. The electrical equipment will carry the G-E monogram.

Electric Railway Journal

Consolidation of Street Railway Journal and Electric Railway Review

Published by McGraw-Hill Publishing Company, Inc.

CHARLES GORDON, Editor

Volume 68

New York, Saturday, November 6, 1926

Number 19

Baffling Problems

Are Those Worth Solving

EVERY industry is confronted with problems that for a time baffle solution. They are discussed by the many, but tackled seriously only by the few. For a time they stay the wheels of progress. The industry as a whole pauses and shakes its head. The rank and file think more of the difficulties involved than of the solution—that's why they remain in the ranks. But each of these baffling problems presents an opportunity as well as a difficulty. They test the wisdom, initiative and energy of the men who encounter them.

The electric railway industry has more than its share of baffling problems. It is beset on every side by difficulties that to many have seemed to defy solution. Inadequate revenue, restrictive franchises, burdensome and unfair taxes, listless employees, unfair competition, obsolete equipment, traffic congestion—these have all seemed for a time to be insurmountable difficulties.

But the very number and difficulty of these problems in the electric railway industry measure its opportunities. To the very extent to which they baffle solution by the many do they offer opportunity to the few—to those who have the heart and the courage and the imagination needed. Among those who are today courageously grappling with the electric railways' baffling problems are the industry's leaders of tomorrow.

Jitney Controversy in Detroit

Appears to Be in Final Stage

STILL another chapter has been written in the story of the attempt by the city of Detroit to bring the jitneys operated on its streets under regulation. The latest move is an order by the State Supreme Court which sustains a previous order made by Justice Bird last July enjoining the city from enforcing the jitney regulation ordinance pending a decision by the United States Supreme Court. The city wants the case advanced on the court calendar before further damage is done to the railway.

The jitney matter has been before the people of Detroit now for several years. The various moves made are all reviewed briefly elsewhere in this issue of the JOURNAL. It has been a long contest, far too long. The conclusion is inescapable that the management of the municipal railway has been embarrassed beyond measure by this unrestrained competition, which last year mulcted the revenues of the municipal system to the extent of more than \$1,000,000.

Long before the recent referendum city officials felt sure of their ground in contending that the jitneys are a menace, and so they considered themselves justified in carrying on an intensive campaign against them. That public opinion had been appraised correctly was

shown by the vote at the election on Sept. 14, at which an amendment was defeated which would have allowed 500 jitneys to operate under city license on Woodward, Jefferson and Grand River Avenues and on Fort Street.

At the inception of the controversy in Detroit there was no disposition to deal harshly with the jitney owners. Notice was served to them long in advance that on a specified date they would be expected to withdraw from the field. They were never disposed to comply with this order. Instead they elected to give battle, in behalf of what they considered their rights. In the meantime, however, they have been a source of constant annoyance to the management of the municipal railway. It is to be hoped that the United States Supreme Court will heed the plea for the advancement of the case on its calendar. The issues at stake justify it.

Closer Control Needed

Over Operations that Obstruct Streets

IN THE streets of mid-town Manhattan the New York Police Department recently found more than 200 obstructions to traffic caused by building operations, repairs to water, gas and sewer pipes, subway construction, etc. Movement of all traffic was greatly hampered. Street railway service suffered seriously because the presence of these obstacles in the vehicular roadway forced an unwonted volume of traffic onto the car tracks.

The existence of obstructions of this kind in the streets is not a new evil, but the tremendous increase in the use of the automobile has brought it sharply to the fore in all large cities. Although a permit from the municipal authorities is ordinarily a prerequisite for work that will result in blocking a street, the officials responsible for the circulation of traffic seldom are consulted. Building permits generally are granted by the building department and permission to open the pavement by the street department. The traffic department is left to deal as best it can with the situation thus created. Before the advent of the automobile this policy probably served well enough, but nowadays, when every available inch of roadway is needed for traffic, closer control should be exercised over operations that obstruct the streets.

Some interference to traffic doubtless is unavoidable during the construction of any building of considerable size. Often, however, the builder avails himself far too liberally of the public street for the storage of his materials and the location of his machinery. A certain amount of ingenuity and possibly some slight additional expense might be required to reduce the amount of obstructions to a minimum, but, after all, the right of the public to the use of the streets is superior to the convenience of an individual. By firm exercise of the

municipal authority it would be possible to reduce greatly this kind of obstruction.

Similarly, obstructions resulting from repairs to water, gas and sewer pipes cannot be eliminated entirely, but they can be lessened materially. In new developments such pipes can be laid under the sidewalks or in parked strips along the curb where reconstruction will not disturb costly pavements nor interfere with vehicular traffic. In older districts, of course, these utilities have already been installed and cannot well be moved. Nevertheless, much can be done to co-ordinate repair work so that the street will not be opened today to fix one set of pipes, and again next week to fix another set. Many renewals can be made to advantage when the paving is open without waiting for breaks to make them necessary. When a section of Fifth Avenue, New York, was opened up some years ago seven gas mains were found where two would have sufficed. No authority existed, however, to order their reconstruction or repair, and new pavement was laid over the old mains. During the ensuing six months more than 50 openings had to be made in this new paving.

More attention is being given to this subject today from the standpoint of protecting the pavement. Its importance as a cause of traffic congestion, however, is often overlooked. In congested districts the latter feature of the situation is fully as serious as the former and deserves the careful consideration of municipal authorities.

A Governor

Hell Bent for Heaven

GOVERNOR PINCHOT of Pennsylvania has appointed R. J. Beamish to the Public Service Commission to represent, as he said, the public as contrasted with the utilities of the state and has tagged Chris Golden, another of his recent appointees, a representative of labor on the commission. But that is not the end of this iniquity. The Governor says that he hopes "to be able in the near future to announce the appointment of another commissioner whose attitude toward the rights of the public will be the same." Probably not one bit of fault can be found with either Mr. Beamish or Mr. Golden, but how unfair it all is to them, to the public and to the state as a whole. No similar case is recalled in which a Governor so labeled men named by him for appointment to a regulatory body.

The Governor has been almost continually at war with the Public Service Commission ever since he has been in office. There is no mistaking his leaning. The conclusion is inescapable, however, that he is either unable clearly to conceive the character and purpose of the Public Service Commission as defined in the law or he chooses to disregard its specifications and spirit.

For his attitude he is rightly called to account by the *Philadelphia Public Ledger*. The whole idea of regulation is that it shall be conducted by a quasi-judicial body. It is not supposed to reflect the desires or views of a particular class or faction. Like the courts, the regulatory body sits in judgment on the facts and the evidence. As the *Ledger* says, it presupposes these new members will permit their judgment to be swayed in accordance with the humor of the forces they are supposed to represent. In designating his appointees as he did, the Governor takes from them

the first requisite of efficient service— independence of judgment and decision. His attitude represents an assumption of power not conferred by any state law.

It will not do to dismiss the issue with the thought that the Governor will be out of office the first of the year. The matter is too far-reaching for that. The question that arises and is being asked is how the ends of impartial judgment can be attained when members are appointed specifically to represent the ideas of this and that shade of opinion. Such action is not at all in conformity with the intent of the law or with ordinary ethical conceptions. It can only be explained in terms of the acts of the zealot "hell bent for heaven," to whom every corporation, even at its best, is the embodiment of the world, the flesh and the devil.

Utilities Hit by

Higher Learning Wave

WITH the serious season well under way systematic and clearly-defined educational plans have been evolved by many railways, with hundreds of employees and officials, too, enrolled for courses in instruction desired, needed or suggested. Among the prominent exponents of the educational theory is the Boston Elevated Railway. Here under a carefully selected staff of instructors an employee can indulge in electric railway law, public speaking, reading and current events. So interesting and profitable were last year's courses in Boston that many requests were made for similar topics during the 1926-1927 term. In Milwaukee, under the slogan "The Trained Man Wins," the Milwaukee Electric Railway & Light Company is offering to its employees not only necessary information for their advancement but is also giving advice to individuals on the best path to pursue. Subordinates of the Pacific Electric Railway, Los Angeles, who are quick to grasp the opportunity for a limited number, have the privilege of learning the elements in "Traffic Management," with a practical demonstration by men actually employed in such work. Nor has Mr. Mitten lagged behind in this march to higher learning—his men are attending classes for "broader understanding of the principles underlying the company's co-ordinated system, and its varied activities." In the utility classes in Pittsburgh a vice-president sits adjacent to a conductor, so avid are they both for enlightenment on the utility as a business. These above-mentioned properties are fairly well launched on the campaign for the better-informed employee, but there are many other properties in the inchoate stages of this development idea.

This "learning wave," so far as the railway employee is concerned, has followed naturally the universal interest in the subject of utilities and their management. Many university leaders have seen the need for including in their curriculums courses in public utility regulation and management, and certain undergraduate school authorities have arranged for public utility speakers to discuss such phases of the economic life. An instance of the latter is seen in Ohio, where the state superintendent of public instruction has arranged for speakers to address various student bodies.

This year such activity in the universities is being continued. Northwestern University of Evanston, Ill., is offering a course in public utilities, and Indiana University of Bloomington, Ind., is giving not a profes-

sional course for the training of future executives but a course in general information. Today, a properly qualified business man can learn at the Harvard Business School methods of public utility regulation through a study of utility decisions. Closely akin to the utility subject is accident prevention, which is this year being discussed at New York University. Again, these are only the "high spots" in this educational panorama, but they are evidences of the present-day demand for knowledge of utilities.

With a corps of better-trained employees and a well-informed management and public, might not the *ne plus ultra* in the railway business be realized? It is hoped and expected that the various studies now being undertaken will be reflected in a new service, sympathy and solidarity embracing the public, the management and the employees.

Nashua Pioneers for True Bus Flexibility

ON THURSDAY, Oct. 28, 1926, the Public Service Commission of New Hampshire issued an order that will make it possible for at least one electric railway operator to take full advantage of the flexibility of the motor bus. Under this order, the commission gives the Nashua Street Railway the broadest possible right "to decide for itself what streets may best be included in convenient and profitable routes."

Heretofore, only the lawless jitney has been able to choose its routes at will. When electric railways have entered the bus business, as at Nashua, they have found the flexibility of the bus greatly circumscribed by the condition that they were expected to run over the same route throughout all hours of the day and all days of operation. The operator has not been permitted to use his own judgment in combining maximum service to the public with best returns to himself.

Naturally, so broad a right is not lightly granted. In the case of the Nashua Street Railway, the commission recognized points of special merit. The company had earned the confidence of its local public in every possible way and was known to be doing all in its power to give service to all parts of the city. However, its bus operations were hampered by the customary terminal-to-terminal restrictions. It seemed to the management that if the bus routes could be shifted to meet varying requirements of service in different parts of the city, such routes would be much more useful to the community. This decision helps to establish a precedent in car and bus co-ordination that will surely aid the industry everywhere.

Advertising Plays Important Part in Everyday Existence

MANY statements of interest to manufacturers and electric railway men were made by President Coolidge in an address on Oct. 27 before the annual convention of the American Association of Advertising Agencies. The President, who is temperate of speech and self-effacing in action, praised advertising as having played a leading part in stimulating the growth of the United States and in making possible the maintenance of a high standard of living and a high scale of wages.

Advertising, a comparatively new but none the less potent force, is a factor that is shaping economic destiny. It is doing it in one field no less than another, but its effect is not evenly appreciated. In other words, the consciousness of it is deeper in some lines of endeavor than in others. Its value as a business builder has been slow to express itself in the electric railway field—far too slow. There is no need to reiterate the reasons why this is so. In the sale of transportation, as in the sale of any other commodity, it is essential that the merchant know the important part that advertising plays today—that he be fully cognizant of the fact that advertising is one of the most potent influences in adapting and changing the habits and modes of modern life, affecting what we eat, what we wear—the work and play of the whole nation.

Railway men everywhere should read the President's speech. And in reading it they should remember the truism on which his central theme revolves, namely, that mass demand has been created entirely through the development of advertising and that while advertising is the life of trade its successful use depends upon a representation of the exact truth.

No statement of these virtues made for advertising by anyone within the profession would have carried the weight that the President's remarks did.

Cost Accounts Should Do More than Record Expenditures

IGNORANCE of essential facts often leads to serious errors of omission or commission in management. It is to the accountant that the railway manager must look for his facts. But accountants as well as other department executives are seeking economies in the operation of their departments and in so doing the basic facts relative to the economies of old versus new equipment are often not revealed.

This was effectively shown in a recent examination of the monthly statements of a large interurban property. New light-weight cars replaced old ones on one division, yet the cost of equipment maintenance showed no change to the division affected, because the savings were spread over the whole property. This was the result of a practice existing on many properties of throwing the cost of maintaining all equipment into the prescribed classification of accounts and prorating to divisions on the basis of car mileage. There is consequently no basis for determining the relative cost of different groups of cars or of knowing when the costs on obsolete equipment have become excessive.

It seems even more important to classify accounts between groups of cars than between the different classes of work on all cars. The present classification, of course, has many obvious advantages and has become a standard with the I.C.C. and many state commissions. For bookkeeping purposes it has proved satisfactory and adequate.

Cost accounts should do more, however, than form a mere record of expenditure. They should serve as an active guide in the administration of operating and maintenance departments. In the equipment accounts, particularly, the present classification falls far short of this requirement.

**Merchandising
Transportation
on the
Illinois Traction System**



Attractive Passenger Stations Help to Build Traffic on Illinois Traction System

No. 1. Terminal at St. Louis in the heart of the business district, carries a large electric advertising sign.

No. 2. Danville office and station.

No. 3. Combined attractive substation and passenger station at Seneca, showing improvement of grounds and landscaping done by employees.

THOS. GOSCH ©

FREQUENT TRAINS TO ILLINOIS POINTS

Illinois Traction System

STATION 12TH and LUCAS

Capitol Limited 8:00 A.M.
Mini Limited 2:00 P.M.
Owl Limited 11:00 P.M.

De Luxe Limiteds
ST. LOUIS & SPRINGFIELD-PEORIA

Merchandising the Company's Service with Large Billboards that Point Out the Character of Its Operations and Create a Desire to Ride

Illinois Traction

Checks Passenger Decline with Improved Equipment and Service

More Attractive Equipment, Faster Schedules,
More Frequent Service and Intensive Merchandising
Effort Cause Recovery of Passenger Receipts
in the Face of Severe Automobile Competition



Parlor Car Train
Operated on the
Main Line
in Fast
Limited Service

IN COMMON with other electric railways throughout the United States, the Illinois Traction System has been confronted by a condition of dwindling passenger traffic due to the tremendous increase in the use of private automobiles in intercity transportation. Not only has the number of private automobiles greatly increased, but their use in intercity transportation has been fostered by the annually increasing mileage of paved highways.

An alarming decrease in passenger revenue made imperative extraordinary efforts to check the decline. The measure of success in these efforts is shown by the fact that the curve of passenger earnings again is turning upward. The number of registered automobiles in the state increased from approximately 950,000 in 1923 to more than 1,350,000 in 1925. The mileage of paved roads in the counties served by the Illinois Traction System increased from 890 in 1924 to 1,006 in 1925. More damaging, however, to the company's passenger earnings than the increase of 15 per cent in the hard road mileage was the closing during the year of many unpaved gaps in the existing hard road.

As a result of this paved road competition, passenger earnings, which amounted to approximately \$1,100,000 during the six months period ended Oct. 30, 1923, failed to increase during the six months period ended April 30, 1924, and then began a rapid decline. Earnings for

the six months period ended Oct. 30, 1924, amounted to only approximately \$850,000, and a further decrease was noted for the six months period ended April 30, 1925, when passenger earnings were less than \$800,000. At this point strenuous efforts on the part of the passenger traffic department resulted in slightly increased traffic and earnings held steady for the six months period ended Oct. 30, 1925, at slightly less than \$800,000. Results of the intensive campaign to increase passenger revenues did not, however, become fully apparent until April 30, 1926, when the upward movement of passenger earnings began. A detailed story of the accomplishments along this line is told in the brief presented by the company in competition for the 1926 Coffin prize.

The first step taken to increase passenger traffic had for its object the development of through riding between the larger cities on the line. To accomplish this a revision of schedules was made. More trains, faster running time and better connections were provided at the larger cities all along the line. From Peoria to Springfield and St. Louis an additional "Tangerine Flier" was provided, bringing the number of these popular trains up to four daily, in addition to the "Capital Limited," parlor car train, and the "Owl," sleeping car train, between these points. This marked the adoption as permanent of the Tangerine Flier service inaugurated late in 1924 and described in the Nov. 29, 1924, issue of

ELECTRIC RAILWAY JOURNAL. The Tangerine Fliers operate on extremely fast schedule between Peoria and St. Louis. Special cars are used for this de luxe service. Seating arrangements provide for both the usual type of coach seats and also for parlor car chairs. No extra fare is charged on the Tangerines. The cars are painted a special color, developed by the Illinois Traction System, which for advertising purposes has been given the trade name of Tangerine. This has been effective in calling the public's attention to these trains.

SPEED AND FREQUENCY OF SERVICE INCREASED

From Peoria to Bloomington and Decatur an additional limited train was added, bringing the total number of limited trains in each direction up to four daily. Connecting Springfield, Decatur, Champaign, Urbana and Danville four fast trains each way daily were provided and schedules for both local and limited trains on all divisions were readjusted to improve service. An intensive campaign of advertising was then inaugurated. Newspaper display advertising was employed in announcing the changes, and in addition thousands of time-table circulars were sent out to chambers of com-



Information Booth at State Fair Helped to Advertise the Illinois Traction System Service and to Make Friends for the Company

merce, fraternal and civic organizations, churches, societies and associations throughout the territory. In cities where chambers of commerce were in existence arrangements were made whereby copies of the circular were mailed to each member of the chamber. This advertising activity was supplemented by the usual circular and time-table matter distributed in stations, by time-table distributing companies, in railroad guides, railroad stations, on connecting lines, in hotels and by travel bureaus, etc. Arrangements were made even with a number of taxicab companies in the larger cities to distribute condensed time-table circulars in the "take-one" boxes in the cabs.

Organization of a "Traction Go-Getters Club" also helped in building passenger revenue. Letters were sent to the employees of every department of the road urging them to be on the alert for passenger business and asking co-operation with the passenger traffic department by turning in tips on probable passenger movements, whether of a single individual or a considerable number. These bulletins, sent to each employee at monthly intervals, had the effect of keeping constantly in the minds of each his vital interest in the welfare and prosperity of the company. Each month many tips were sent to the traffic department covering prospective freight and passenger business. These tips are turned over to the traffic department representative in the district where they originate, and personal solicitation for the business is made.

The Illinois Traction System is in competition with twelve steam railroads. In an effort to make its service more attractive, the company instituted the sale of a \$10 coupon fare book at a 10 per cent reduction. The book, which sells for \$9, contains \$10 worth of 1-cent coupons good for bearer and party for one year from the date of sale. The coupon books are advertised as a 10 per cent reduction under the regular interurban fare and a 25 per cent reduction under the steam road fare. Frequent riders are urged to purchase these books, with the object of establishing the habit of riding the electric line. The use of coupon fare books is just entering upon its second year, and its popularity is illustrated by the fact that sales now exceed those of a year ago by 83 per cent.

Recognizing the efficacy of building public good will as a promoter of business, the company has bent its efforts toward the creation of a good will asset by rendering special, out of the ordinary service when opportunity offers. Where large group movements require special trains these are provided, and traffic department representatives are trained to give attention to the comfort and needs of the party. These special parties not only add to the passenger revenue but they create good will and have the cumulative effect of promoting future business, as is evidenced by testimonial letters received from many sources. Special attention is paid to baseball enthusiasts who wish to attend Three I League games at Peoria, Bloomington, Springfield, Danville or Decatur, or the major league games at St. Louis. In all the cities named special arrangements are made to set aside certain blocks of seats for Illinois Traction System patrons, so that those desiring to attend games may purchase tickets at traction ticket windows.

REGULAR PARLOR CAR AND SLEEPER SERVICE OPERATED

The Illinois Traction System claims to be the first electric railway to adopt regular parlor car and sleeping car service. This has been successfully continued. The latest addition to its sleeper service is that started in 1925 between Champaign, Ill., and St. Louis, a distance of 198 miles. Because of the lateness of the hour at which sleeping car passengers arrive at Champaign, 8:30 a.m., a light breakfast is served, for which no charge is made. The porters hand each passenger a small card on which is printed "Good Morning—This light breakfast is served by courtesy of the Illinois Traction System to guests aboard our St. Louis-Champaign sleeping car." As a result of the establishment of this service the St. Louis to Champaign traffic has been increased 41.9 per cent and Champaign to St. Louis traffic increased 57.45 per cent over the previous year.

The value of paint and a general appearance of attractiveness, which has proved so effective on the Tangerine Fliers, is also being demonstrated on the company's suburban line connecting St. Louis, Venice, Madison and Granite City, Ill. Cars operated in this service are run in two-car trains. Recently a change in the color scheme and vestibule arrangement met with an immediate response from the riding public. It was noticeable that when the newly painted cars were placed in operation with the old cars during mass movements they were plainly preferred by the car riders. The program of reconstruction includes the removal of the front bulkhead and the addition of two seats in the front end of the car. A small cab was built around the motorman's position. The partition forming this cab



Exterior Views of New "Tangerine Fliers." Distinctive Color, High-Speed Operation and Semi-Parlor Car Facilities with no Extra Fare Have Helped to Build Up Riding

is equipped with glass above the watertable, thus allowing passengers a clear view ahead of the car. All light and heat switches, as well as all equipment pertaining to the operation of the car, formerly exposed on the front platform, are now hidden from view. Economy meters are placed inside the cab where the motorman may easily read the registration. This arrangement also eliminates the practice of smokers standing on the front platform. Those desiring to smoke are requested to ride in the trail car and consequently all passengers seem to be pleased.

Tightening of passenger train schedules on the main division has not only resulted in more economical but also more efficient operation. Revised passenger schedules with an average speed for all limited trains of 29.56 m.p.h., compared with 27.22 m.p.h., and an average speed for local trains of 24.34 m.p.h., compared with 22.45 m.p.h., resulted in having 93.5 per cent of the passenger trains on time daily, which is an improvement of 4.2 per cent over the previous year.

Passenger car miles for the year ended May 1, 1926, showed an increase of 13.3 per cent over the previous year, while passenger trainmen's hours for the same period showed an increase of but 7.77 per cent. This is evidence that the addition of trains and reduction of schedule time have proved to be an economy. Many ways have been found for speeding up passenger schedules. Delays in getting trains through congested sections of the cities have been eliminated by enlisting the co-operation of municipalities and other carriers and by routing freight trains either around

the principal cities or over routes that do not interfere with the operation of passenger trains.

The installation of flashing light signals at street corners has eliminated previous positive safety stops in some of the smaller towns, the installation of crossing gates over railway crossing tracks, which are set normally for Illinois Traction trains, also help. Electric switches make it unnecessary for trains to come to a stop. Flagmen of street railways over which Illinois Traction trains operate, flag trains over railroad crossings and station agents in the small towns flag public street crossings adjacent to their stations. All these arrangements have helped to speed up service and have made it possible to operate limited, non-stop passenger trains while at the same time increasing safety. These improvements have likewise affected the freight service. They have made it possible to put through freight trains on working time-tables and have helped to increase the allowable tonnage per train.

The use of one-man interurban equipment on the Illinois Valley Division has been given more than one year's test and has resulted in increased riding, reduced operating expense and increased earnings. Although the Illinois Valley Division operates 106 miles of track through sixteen stations and carries baggage and express on all trains, the management decided that one-man operation was entirely feasible. Consequently, seventeen new one-man, single-end, double-truck cars were purchased and substituted for the heavy equipment previously used. The former schedule was on a two-hour basis.



Interior View of New "Tangerine Flier"

The present schedule, providing hourly service, was inaugurated on Aug. 1, 1924.

Where previously interurban cars weighing 94,000 lb. and equipped with four 100-hp. motors were used, the new one-man type of car weighs only 37,000 lb., with four 35-hp. motors and K-35 control. Particular attention was paid to passenger comfort and general attractiveness. Seats in the main compartment are plush covered, the floors are covered with linoleum and each seat has arm rests and an adjacent coat hook. Sand-

	1923	1925	Saving per Car-Mile	Per Cent Reduction
Equipment	3.60	0.95	2.65	73
Power purchased (all service)* 5.80	3.35	2.45	42	
Platform expense	5.17	3.75	1.42	27

*Includes freight and city service on this division.

blasted pebble glass upper windows of the Gothic type give the car a distinctive appearance. These cars are geared to about 40 m.p.h. at 600 volts and on an average line voltage of 520 make an average speed of 21.4 m.p.h., with one stop per mile of 35 seconds average duration. Passengers ordinarily enter and leave by the front door. However, at heavy loading points the rear door may be operated by an air valve outside the car and fares collected by street fare collectors. Passengers pay to their destination when entering the car and receive destination checks, which are surrendered to the operator upon leaving the car. A full description of these cars was given in the Jan. 10, 1925, issue of *ELECTRIC RAILWAY JOURNAL*, page 51.

With these one-man cars on hourly schedules reports show 97.2 per cent on time, as compared with 92 per cent for the same twelve months period under two-man operation of old cars on a two-hour schedule. The one-man cars have practically eliminated platform accidents. Only one such accident has been reported since the cars were put in operation. Reduction in operating cost per car-mile for those accounts affected by the new cars are shown in the accompanying table.

The results of the operation of these cars have been so satisfactory that the company has appropriated funds for the purchase of ten additional cars of the same design to be used on branch lines of the main division to replace heavy, two-man equipment. Other similar equipments include the remodeling and acquisition of light-weight, double-truck one-man cars for city service in La Salle and Peru and branch line service on the Vermilion Heights and Catlin branches out of Danville. All three of these situations have responded to the improved service and marked economies in operation have been effected.

Employee Savings Made Easy by Northern Texas Traction

TWO plans for employee saving have been perfected by the Northern Texas Traction Company of Fort Worth, Tex., as of June 1 this year. These plans are an outgrowth of successful Liberty Loan sales made during the war period and later sales of 7 per cent notes by the company.

Through arrangements with the Tarrant County Building and Loan Association any employee of the Northern Texas Traction Company may ask the company paymaster to deduct any amount the employee desires and apply it to building and loan shares. These deductions bear interest at the rate of 8 per cent. Pro-

vision is made for withdrawal on the part of the employee at any time without loss of interest.

A second plan of saving is in the nature of life insurance. This is accomplished through the Southwestern Life Insurance Company, with which any employee may take out a policy of any amount and have it paid for monthly by regular deductions from the pay check. Through the arrangements of the Northern Texas Traction Company with the insurance company, the premiums for this insurance are at a lower rate than would be charged for an individual policy. Any form of policy may be selected by the employee, the rate, of course, depending upon his age and the type of insurance selected. Also, this insurance may be retained in case the employee for any reason leaves the company. In case the age of the applicant is under 45 years, or the amount of the policy is less than \$5,000, no physical examination is required.

This insurance is entirely separate and distinct from that carried for each employee through the mutual aid and group life insurance plan carried by the company.

Both of these savings plans are explained in the company's 1926 Coffin prize brief.

Rear Awning Protects Bus Passengers

ALL buses of the El Paso Electric Company have been equipped with awnings which shade the rear seats and keep the inside of the buses cool. These awnings make riding more comfortable, especially during rush hours in the morning and evening when the buses are crowded. Many favorable comments have been received from passengers. Mention is made of this device in the brief presented by the company in competition for the 1926 Coffin Prize.

On the back of each bus has been painted a sign which reads "Toot your horn and this bus will gladly move over." This sign has done much to create good will. It shows the drivers of private automobiles, whom the company is endeavoring to secure as customers, that



Buses of the El Paso Electric Company Are Equipped with Awnings at the Rear to Protect Passengers from the Glaring Sun

it is trying to do its share toward keeping traffic moving smoothly. Keeping this sign constantly before them also tends to make them more considerate of the rights of other users of the street. This, in turn, reacts to the advantage of the company. Many people have expressed admiration for the spirit of fairness and co-operation which prompted the El Paso Electric Company to place this sign on its buses.

Elaborate Safety Precautions in Baltimore

Efforts Are Addressed to Public and Employees, and a Number of New Methods Have Been Put in Operation This Year—They Include Distinguishing Straps for Car Greasers, New Rule Book, Expansion of Safety Courses, Lighting of Waiting Areas on Streets, Etc.—Gratifying Gain from Safety Work Done Thus Far

FOR a number of years past the United Railways & Electric Company of Baltimore has paid a great deal of attention to means for reducing accidents. Its safety program has included teaching safety intensively and constantly to its employees; imparting safety information to children in the schools and at all public gatherings of children; impressing safety rules and practices upon the general public by widespread publicity, and eliminating hazards and adopting safeguards in operation and service whenever opportunities appear. The success of this effort is shown by the lower accident records of the company.

In 1925 there was but one boarding and alighting accident and but one person injured in street car collisions in Baltimore for each 106,210 passengers carried, while in 1919 there was one such accident and injury for each 63,817 passengers carried.

In the three years ended December, 1925, the decrease in the number of pedestrians struck by cars was 11 per cent; in persons injured while boarding cars, 24 per cent; in persons injured while alighting from cars, 51 per cent; in passengers injured in collisions between cars, 12 per cent; in injuries to occupants of horse-drawn vehicles, 43 per cent; in accidents to employees, 4.9 per cent. Injuries to occupants of motor vehicles in collisions with street cars increased 2 per cent.

But the net decrease in personal injury cases from all causes during the three years ended December, 1925, as compared with the three years ended December, 1922, was 17 per cent. Compared with 1919, the decrease in 1925 was 34 per cent.

In the same comparative periods street car accidents resulting in fatalities decreased 20 per cent.

Comparing the same periods, accidents resulting in claims have decreased from 37 per cent of the total to 29 per cent, and the percentage of gross revenue expended for claims and suits decreased from 4.61 per cent in 1920 to 3.45 per cent in 1925. Evidence that the trend is still downward is found in still further decreases during the first six months of 1926, indicating 3.25 per cent of gross revenues.

The company's methods of impressing upon its men the necessity for thinking of safety always will be dealt



These Markings on the Pavement at a Curve Are a Warning to Pedestrians of the Overhang of a Car

with later on, but at the outset the story of its most recent efforts to reduce accidents will be told, as given in the company's presentation in the Coffin contest for 1926.

Early in May, 1926, the company launched a series of "Week-End Safety" campaigns. Each Monday morning the newspapers carried stories of the long lists of accidents that had occurred on Saturday and Sunday when thousands of families were taking summer holidays. Many tragedies were among them, by far most of which involved automobiles. The street car accident reported over the week-end was rare.

But the company used the newspaper publicity given to week-end accidents as a vehicle to carry its own safety messages to its men. Large posters were placed in all carhouses and substations and in the company's offices as follows:

Accidents Over the Week End
Mar Happiness in
Many Homes
Make Our Service
SAFE
Prevent
WEEK-END TRAGEDIES

At the same time cards were distributed addressed "To operating employees," and reading in part:

All of us know the week-end toll of accidents. Monday's newspapers carry columns about these mishaps. Lives are lost. Untold suffering and economic waste lie in the wake of week-end holidays.

In the interest of public safety this company is co-operating in efforts throughout the city to

PREVENT WEEK-END ACCIDENTS

We have the utmost confidence that every man in this company will lend his full assistance to this worthwhile effort.

The responsibility is placed squarely upon you and we know you will be equal to it. SAFETY DEPARTMENT,
United Railways.

No accidents involving street cars were reported in the newspapers on the first Monday morning following the launching of the campaign, and at once the safety department put out posters, reading:

Street Cars and Buses Were Absent
from Newspaper Accounts
of
SERIOUS WEEK-END ACCIDENTS
You Demonstrated Skill
and Carefulness!
BEAT LAST WEEK'S RECORD!

This time, too, cards were distributed to all operating men, reading:

Street cars and buses were conspicuously absent from Monday's newspaper accounts of serious accidents in this city last week end. Your special effort to bring about this result was another evidence of the fine team work and co-operation which always produces results in our organization.

As we approach another week end, we are confident you will not be found lacking in any particular to beat last week's record. It can be done and you will do it.

The following week the posters contained lists of the lines of the system, without a single accident, serious or trivial, with the legend:

**HELP PLACE YOUR LINE IN THE
NO-ACCIDENT LIST THIS WEEK END**

The newspapers took up the campaign and printed articles about it, featuring the company's efforts with such headlines as:

WEEK-END TROLLEY SAFETY CAMPAIGN ON
Effort Started by United to
Cut Down Holiday
Mishaps

Another story was headed:

SEEKS TO REDUCE ACCIDENTS
United Railways Will Use Posters
as Part of Campaign

NEW IDEAS WERE PUT INTO EFFECT

Several new ideas intended to impress the value of safety personally upon the men in the track, shops and power departments were put into practice during the past year. One was the regular distribution to the men in these departments of monthly accident record cards, showing how many men in each department had clear accident records for the month, but bearing in a list the names of the men who were hurt. The effect of this publicity to the men who had been hurt was a decrease of 15.8 per cent in accidents in the first five months of 1926, while the decrease in May, over May, 1925, was 33 per cent. The deep impression made by printing names of injured men probably was responsible.

TRAFFIC COP BELTS FOR CURVE GREASERS

Another was the adoption of crossed white safety belts for curve greasers and men engaged in trackwork on the street—belts exactly like those worn by Balti-

more's traffic policemen. The object, as in the case of the policemen, was to increase the visibility of the company's men. In sixteen months 31 of them had been hurt, some seriously, by reckless automobilists. These belts have greatly reduced the hazards of street work for the curve greaser and track worker.

Still another was the regular issue of instruction leaflets to motormen and conductors, each leaflet covering a special subject directly affecting the safe operation of street cars. The list of subjects so far covered follows: (1) The pedestrian, (2) boarding and alighting accidents, (3) passengers injured on cars, (4) collisions between cars, (5) collisions between automobiles and street cars, (6) employee accidents, (7) "assured clear course."

The leaflets are printed on colored paper, a different color for each leaflet, and are as simply and as interestingly written as possible. After each "lesson" there is a list of questions relating to the subject of the "lesson."

MOTORMEN'S SAFETY CONFERENCES

A fourth innovation during 1926 was a series of special safety conferences especially for motormen, added to the regular safety meetings of many sorts. In all the regular conferences motormen and conductors meet together, but the company believed special work should be done by and with the motormen. These special conferences began March 12, 1926, and so far about 700 motormen have attended them. They are addressed by the superintendent of transportation, the safety director and the claim agent of the company, and have brought good results not alone in improved accident records, but in more thorough participation by the motorman in the company's affairs, since the company's problems are discussed with the utmost frankness. The special safety conferences for motormen will be continued until every motorman on the system has attended them. Then a similar special series will be held for conductors.

In Baltimore regular courses in safety instruction start with a man's first days on the system and before he actually begins work. He must pass a rigid medical examination and exacting tests of eyesight and hearing. Then he must spend several days in school rooms for conductors and motormen. These school rooms are equipped to teach the men everything about a street car and its work. For motormen there is a series of lights showing the path of current from the trolley. By this means they are taught the principles of energy saving as well as the principles of safety. In January, 1926, a new rule book was issued. The safety department really inaugurated the revision and took the initiative in actually revising the rules, with the result that by far the most of the new rules relate to safety. Then, in order, if possible, to insure their being thoroughly read and understood, the safety department started its accident record card plan of keeping the recent accident records of their lines, or their friends, closely before them. One card would read, in part: "Have you read the new rule book? If there is any rule you do not understand, please indicate the number of it so it can be more fully explained."

There would also be a question concerning the rules on the card, which every man was supposed to answer in writing, turning the answer in to his superintendent. The cards for each department would contain the names of men who had had accidents during the month.



Curve Greasers Wear Crossed White Belts as a Protection in Heavy Traffic. Note Also the Stop-Go Station with Safety Striping

These cards were supplemented with such posters as this in all carhouses:

DO NOT FORGET!
This Month's Question on Your Accident Record Card
Have You Read
THE NEW RULE BOOK?
It Is Important
DO IT NOW
REMEMBER TO GIVE THE NUMBER
OF ANY RULE YOU DO NOT UNDERSTAND

About three-fourths of the men replied that they had read the rules and understood them. Those who did not reply, or who replied negatively, were checked up. Then, month after month, the card system was carried on, the questions asked on each card being answered on the card issued the following month, which also bore new questions.

The plan worked about like this: Many collisions between cars were occurring, due principally to motormen running their cars into open switches and colliding with cars on other tracks. So, on all cards issued to motormen one month, this question appeared: "What are the rules governing the operation of your car at a facing switch of any type?"

About half the motormen replied, "Slow down," or "See that switch is properly set," and so on. On the card issued the following month the correct answer was printed—the rule requiring them to come to a full stop was quoted. The result was a marked decrease in the number of collisions of this sort.

SCHOOL ROOM AND PLATFORM INSTRUCTION

To go back a moment to the company's regular system of training men in safety practices: After their school room experience they are sent out on the cars to do practical work under instructors. If a man is quick and careful, the instructor may stay with him only a week. If he is slow, the instructor will spend more time with him. During this period of instruction

and for some time afterward the men must attend weekly safety lectures, which include painstaking discussions of accident prevention, the need of knowing one's own line thoroughly; the company's plan of organization, and general outlines of the work of all the company's departments.

It is in these lecture periods that the company's service department is represented with talks on courtesy and the great influence of the car man's position upon the company's relations with the public.

Once accepted for service the new motorman and conductor are eligible to serve on the company's "safety committee," which is a sort of "safety congress," or "house of delegates" within the company. Each line on



Self-Illuminated Reflector Signs Warn Automobilists Day and Night of Dangerous Crossings with the Railway

the system is represented on this committee by a motor-man and conductor, and there is a representative from each department, including the bus transportation department and the claim department. Members serve for four months and then other representatives are elected to succeed them. Every man on the system is thus given a chance to be a safety committeeman.

They meet frequently during their period of office to thresh out safety matters. The best results have been achieved by holding special meetings for each particular group—one for operating men, one for shops, power and track men, and so on. Each committeeman is virtually a "safety scout," with a watchful eye for clues to unsafe practices. In the course of a year these committee-

In the company's own safety work among children and the general public, many new things were accomplished last year. At the Better Homes Exposition in the Fifth Regiment Armory, where the company's bus and street car exhibit was one of the most popular, a "Kiddies' Theater" was a noteworthy feature, with rows of little benches decorated with friezes of birds and animals, and a moving picture screen on which was shown a safety film made by the company, entitled "Perilous Paths," and there were other movies and stereopticon pictures. The show was continuous and so was the audience.

At the end of each showing of the film an "essay contest" was announced, and paper and pencils were



Forty-eight Gas Beacon Lights and Eight Electric Beacons Have Been Installed at Car Stops, Including Baised

men bring in more than 1,000 reports and suggestions and, on an average, about three-fourths of the suggestions are adopted.

In the third month of service of a group of committeemen, they gather in the company's downtown meeting hall for addresses by the heads of departments, and at the last meeting of the term, in the fourth month, there is a big dinner for the entire committee, with speeches by officials of the company, and an entertainment program.

The company is quite active in the work of the Baltimore Safety Council, the general manager of the company being a member of the board of control of the council and chairman of the publicity committee, while the vice-president of the company is chairman of the council's executive committee. The council itself resulted from the "No-Accident Week" campaigns, which will be remembered in Baltimore for a long time, and were initiated by this company. The company contributes substantially each year to the council's work in schools, industries and wherever public safety is important.

In the "Drivers' safety contest," conducted this year by the Baltimore Safety Council for all commercial truck drivers, the railway's drivers finished first.

distributed throughout the "theater" so that the children could write briefly on the subject, "Why Should I Be Careful?" Six Eversharp pencils were offered as prizes, and during the week hundreds of essays were turned in.

The company's "Safety Ladies," who also make frequent talks to classes of children at the public schools, moved through the crowds, pinning "safety buttons" on children, telling them always to "play safely." The whole exhibit with all its features besides the "safety" one was one of the most talked of things in the armory.

The "Safety Alphabet" originated several years ago by this company is apparently as popular now as it was in the beginning. It is a simple set of verses about safety, based on all the letters of the alphabet. Last year requests for copies of the "alphabet" ran into hundreds. School teachers seem to find it an easy way of teaching children simple safety rules, and requests for it have come from all over the country.

Before the company's two summer parks, Bay Shore and Gwynn Oak, open, the safety director makes a general safety inspection, and all the park employees are required to attend safety meetings and read accident prevention bulletins. Special features at each park are fully equipped playgrounds for children, each under the

supervision of an instructor or play leader. This has greatly reduced the accidents to children in the parks. Each park, too, has a completely fitted first-aid room, under the supervision of a physician, where minor cuts, bruises and bathing injuries are treated.

Forty-eight gas beacon lights and eight electric beacons have been installed at car stops all over the city, marking safety zones or loading platforms for the safety and convenience of car riders. In all, there are 76 safety zones for car riders, including eighteen concrete boarding and alighting platforms, five safety zones formed by electrically lighted street buttons, and 53 sets of chains and standards. The concrete platforms are built and installed by the company in co-operation with the Baltimore Police Department, which also contributes one-half the expense of the beacon lights.

The warning, "Danger—Curving Car," has been stenciled on street pavements where the overhang of a car making a turning movement might be a menace to pedestrians, and a broad white line marks the limits of safety while the car is turning. A number of reflector lights which catch the headlights of automobiles and warn motorists of car tracks ahead have been installed at dangerous crossings, where cars curve over busy suburban highways.

Fire drills for employees are frequent all over the system. All buildings are fully equipped with fire-fighting equipment. Block signal systems have been installed, and wherever even a possibility of danger exists at a curve or crossing, warning signals have been put up. At the drawbridges signals have been installed to stop cars when draws are open. These signals are interlocked with the drawbridge and cannot be operated until the signal has first been set to "stop" position. At one such drawbridge (Bear Creek), which is opened frequently to let boats pass, an automatic stopping device has been installed in connection with the signal, so that if the motorman should fail to observe or heed the signal, his car will be stopped automatically.

Wherever shrubbery or embankments in the suburbs have blocked the vision of motormen, the company has cut the obstruction away in the interest of safety.

Equally as important as the practical results of the

company's safety program, in accident reductions and the like, is the sense of confidence in the company which its safety promotion activities give the public. Baltimore people know now not only that the street cars are the safest places on the streets, but that the first concern of the Baltimore street car men is the preservation of public safety.

Ride Selling an Accomplishment of Long Standing on the Northern Texas Traction

MANY ride-selling ideas have been developed in the past year by the Northern Texas Traction Company of Fort Worth. One of these grew out of the co-operation of this company with the Junior Chamber of Commerce of Dallas in the promotion of a building opposite the Union Railroad station in that city. The interurban cars, known as the Crimson Limiteds, operate between Dallas and Fort Worth and pass this station en route. The thought behind the construction of this building facing the railway station was that it would be a permanent and continuous welcome to strangers arriving in the city via the Union Station.

The building was constructed through the co-operation of other railway companies in Dallas, as well as several business firms not engaged in transportation.

The problem of operating the station naturally came up, and it was felt desirable to have someone in attendance day and night who could give dependable information. The company, in co-operation with other railways in Dallas, took over the operation of this building, paying all expenses and erecting a large electric sign, as shown in the accompanying illustration in exchange for the privilege of selling tickets. The railway companies use their own men in dispensing information and for the sale of tickets. The plan was enthusiastically received, and after the building was completed it was officially opened, and for practically a year it has been operated under this plan. This has proved to be one of the principal revenue offices for the Northern Texas Traction Company.

At the town of Handley, 8 miles from Fort Worth and practically a suburb of that city, the company has



Prominent Advertisements Facing the Main Grandstand of the Fort Worth Ball Park. The Top Sign Appeared for Part of the Season and Was Repainted as Shown in the Bottom Picture After the Buses Were Started in Fort Worth

arranged a large, attractive parking station just opposite the Handley interurban station. This parking area has been fenced in and flowers and shrubbery planted to make it attractive. The proximity of the parking area to the station affords a measure of protection, and patrons have confidence in leaving their cars there while going into the city via the interurban. The number of autos taking advantage of this station's parking facilities is gradually increasing, there being from ten to twenty vehicles there at all times of the day.

the path of motorists from Washington as well as from small suburbs inside and outside the city limits.

The other parking space is within a loop of track on a main street car thoroughfare heavily traveled by automobiles from large suburban territories toward the west and northwest. Both of these parking spaces are being equipped with gasoline filling stations and will be manned by men capable of rendering any service to motorists. These men also handle the parking privilege and sell to each motorist a parking ticket and two street



Facing the Union Railroad Station in Dallas Is This Attractive Building Erected by the Junior Chamber of Commerce of Dallas, with the Help of the Local Railways and Other Business Interests. The Local Railways Operate the Building

Aside from the business-getting effect of this parking area, the improvement of the ground with shrubbery has added to the appearance of the city and the friendship between the company and the public it serves.

It is the claim of the company that merchandising transportation does not depend on one or two major things, but on a multitude of small items and small, relatively unimportant details that keep the service of the company constantly before the public mind.

That these methods have been successful is evidenced by the fact that in the four-month period from March to June of this year the company has shown an increase in gross revenue of \$41,000. Specific examples are also given in the presentation for the Coffin prize for 1926 that shows that this increase in gross revenue has been experienced on all divisions and on practically all lines of each division.

Baltimore Provides Parking Space for Automobilists

PARKING spaces for the use of automobilists are being provided by the United Railways & Electric Company of Baltimore at two points on the company's system. They form one contribution by it to the solution of the parking problem, as well as a means of selling service, increasing patronage and improving good will, according to the 1926 Coffin prize brief.

One large lot on Washington Boulevard adjoins the company's shop, outdoor storage house and concrete pole plant. Its present parking capacity is about 60 automobiles. It is directly on a main street car line and in

car tokens for 25 cents. As the price of the tokens is 15 cents, the parking privilege is sold for 10 cents. It permits the motorist to leave his car as long as he likes up to midnight of the day when parking begins.

Modern Storeroom Increases Efficiency

New Facilities and Material Handling Methods on Illinois Traction System Cut Waste—Printing and Reclamation Department Add to Saving

DURING the past year the Illinois Traction System has erected a modern stores building adjacent to its Decatur shops and has installed a system for handling stores that has saved time and reduced distribution cost on materials destined for various departments. The company's Coffin prize presentation gives the results obtained. The regular run of supplies has been standardized by a newly formed standardization committee within the company. Maximum and minimum quantities for various materials have been established and the supply department has thus been able to allot sufficient space in the bins and on the platform for these materials. When any supplies are requisitioned by the stores department from the purchasing department, the quantity that must be in each package is specified. For instance, all galvanized bolts must come in boxes of 50, 2,300-volt insulators in cartons of 50, cross-arm braces in bundles of twenty and high-tension insulators in crates of six. As much of this material as possible is kept in the



Exterior of New and Modern Storehouse at the Decatur Shops of the Illinois Traction System, Which Has Helped to Increase Efficiency by Providing Facilities for the Systematic Handling of Materials

original packages, so it is rarely that any such commodities appear in stock in broken packages.

As a result, the time required when preparing for reshipping to the various departments has been reduced 50 to 60 per cent. The time required in counting for inventory has also been considerably reduced and the material can be stored in much neater shape. For example, 10,000 $\frac{1}{2}$ x 14-in. galvanized machine bolts—200 boxes—arrive at the storeroom. These boxes are stacked on platforms 8 in. high, 16 ft. long and 5 ft. wide, ten boxes (500 bolts) to the stack. One can easily appreciate the saving in time when counting these against the old method when such bolts were received in burlap sacks containing all the way from 400 to 450 in each sack, or when a carload of 50,000 porcelain insulators was received in barrels, each containing from 290 to 315. The new storeroom permits storage of 95

per cent of the items inside, while formerly about 40 per cent were stored outside the building.

The company also maintains a well-arranged stationery and printing department. During the past twelve months this department has printed, gathered and padded more than 4,000,000 forms running off quantities of 20,000 to an operation, instead of buying in quantities of from 100,000 to 200,000. The company maintains a reclamation department in which railroad lanterns, switch and marker lamps, track jacks, etc., which find their way to this department are dismembered, the parts inspected and usable parts prepared for reassembling. As an illustration of the saving made by this department, out of 30-odd switch lamps reaching the reclamation department 21 were turned back into service at a total outlay of less than the value of two new lamps.



Interior of New Decatur Storehouse. Materials Are Arranged so that Inventories Can Be Taken Accurately in a Minimum of Time

Baltimore Company Establishes Private Weather Station

Acting to Supplement the Information Given by the Government Bureau, It Has Helped Greatly in Predicting Storms—It Issues Daily Bulletins to Department Heads

AMONG the most unique of the improvements introduced by the United Railways & Electric Company of Baltimore during the past year is a private weather station. Its purpose, of course, is not in any way to replace the excellent service of the United States Weather Bureau in Baltimore, but to supplement it. Its establishment grew out of trouble incident to a heavy snowstorm in Baltimore on Jan. 2, 1925, when the system was virtually paralyzed for nearly 24 hours. It was a "freak" storm in many respects, beginning about midnight with a heavy fall of sleet that froze to a depth and hardness impervious to the work of sweepers. On top of this sleet came a 13-in. precipitation of wet snow. Thousands of automobiles, coming downtown in the morning, traveled in or near the car tracks, which alone were clear to snow, threw it back on the rails and packed it tightly in the rail grooves. The effect of the almost complete 24-hour tie-up on the transportation system, which was the sole dependence of more than 700,000 daily riders, can be imagined.

To leave nothing undone to avert recurrence of such a disaster, the company sent a committee to a number of large cities in this country and Canada to study snow fighting and snow-fighting equipment. The committee found the Baltimore company as well prepared as any it visited, but recommended a plan of organization for better preparedness in such emergencies, and among other things, the establishment of a company weather station which would permit more frequent and perhaps more detailed reports to be made than could otherwise be had.

STATION HAS COMPLETE EQUIPMENT

The weather station was, therefore, established. It was not a duplication of but an adjunct to the local government station, which, for lack of appropriation, was unable to maintain 24-hour service. If, before closing its offices, the government bureau predicted a snowstorm, the railway company was forced to choose between calling out its snow-fighting forces and perhaps keeping them idle, or assuming the responsibility for getting through the night without them.

The company's weather station, supervised by three members of its engineering staff, is located at emergency department headquarters, where a 24-hour service is maintained. The equipment consists of a barograph, a hygro-thermograph, a thermocouple temperature indicator and a remote indicating wind vane. The last-named instrument was built and designed by one of the company's electrical engineers and consists of a wind vane head located on top of an adjacent tall building, connected through a lead-covered cable to the indicating instrument in the dispatcher's office. Unlike the usual instruments for giving remote indications of wind direction by a system of lights denoting certain points of the compass, the pointer of the indicating dial on the company's instrument follows the slightest movement of the wind vane outside. The same engineer is at work upon a remote curve-drawing anemometer,

and in the near future a new resistance type of thermometer will be installed.

An hourly log is kept of the data supplied by these instruments, and during the snow season a daily bulletin outlining weather conditions and including a forecast for the ensuing 24 hours is issued at 2 p.m., with more frequent special bulletins during the period of a storm. This bulletin is predicated upon the daily weather map issued for the Washington forecast district, and five copies of this map are distributed to officials of the company charged with responsibility for operation and snow removal.

These maps used to come by mail from Washington, but to reduce the delay in their arrival, the company arranged last winter with the Western Union Telegraph Company to have a messenger collect them each day at the Washington office of the Weather Bureau as soon as they came off the presses and deliver them to the noon train of the Washington, Baltimore & Annapolis Electric Railway Company. Through the courtesy of this company, these maps are delivered in Baltimore to a representative of the United Railways & Electric Company by 1:30 p.m. each day. They are thus in time to be included in the preparation of the daily bulletin. To illustrate the form in which the information from the company's weather bureau is given out, extracts will be given from one issued at 2 p.m. on Tuesday, Feb. 9, 1926.

After reporting a summary of the weather situation as shown in the official Weather Bureau map, the reading of the thermometer and the height of the barometer, the report continues:

The outlook for Baltimore is most unfavorable, considerable precipitation being in prospect this afternoon and throughout the night. It is believed that the precipitation will be mostly in the form of snow; however, with temperatures just bordering on freezing there is possibility of sleet.

The situation is to be regarded as serious and every precaution should be taken to cope with a moderately heavy snowfall. The center of the storm may not pass Baltimore until after midnight.

The progress of the storm is being carefully watched, and a special bulletin will be issued at 11 o'clock tonight.

The bulletin continues with a record of the hourly data of the previous 24 hours.

As these bulletins contain forecasts made by the company's staff, they are considered confidential information, since public disclosures of them might be considered invasions of the government bureau's rights.

SUPPLEMENTAL DATA BY RADIO

In addition to the data obtained from the company's own instruments, a radio set was installed and at 10:05 a.m. and at 3:45 p.m. weather broadcasts from station NAA, Arlington, Va., are taken by stenographers and copies forwarded to proper officials of the company.

As the result of all this, the company has a sense of preparedness in the snow seasons that never before was realized. A little more than a year after the storm that tied up the system, there was another snow and sleet storm, namely, on Feb. 4 and 5, 1926. This storm was accompanied by 12 in. of snow and much sleet, tying up telephone lines and interurban railways and working havoc with shipping in Chesapeake Bay, but through its weather station and the improvements that it made in its equipment, the company kept its cars on schedule. The daily newspapers in Baltimore learned the facts and were prompt to praise the company for its foresight.

Co-ordinated Bus Service Makes Profit

Operations of the United Railways & Electric Company in Baltimore Include Both Lines Which Transfer with the Cars and Lines Which Do Not, Sightseeing Trips, Extended Tours and Chartered Buses—The Last Mentioned Business Is Considered the Most Profitable



A Touring Party Starting for Gettysburg on a Motor Coach of the United Railways & Electric Company

ON THE basis of present earnings, the United Railways & Electric Company of Baltimore estimates that its buses are earning annually a net profit of \$20,622.16 in addition to providing a necessary service which if given by trolley cars would have cost \$304,300. Hence it places its total profit and saving from the use of buses to the company at approximately \$325,000 a year. The bus developments of this company are told in its 1926 Coffin prize brief.

The company's first bus line, established some ten years ago to operate between the center of the city and the northern residential section, was put in operation in the heyday of jitneys for the purpose of offsetting the effect of jitney competition and to pre-empt a desirable route. Since that time, but particularly during the past year and a half, the company's bus service has been greatly expanded. All this service is now in charge of the department of bus transportation, a newly organized branch of the company, which directs the activities of:

1. The Baltimore Transit Company, which operates the bus line already mentioned, as well as another serving the northwestern section of the city.

2. The newly acquired East Fayette Street Bus Company, which was bought from private owners and operates a fleet of some 30 single-deck buses from the shopping district to the eastern section of the city.

3. The Gray Line sightseeing and tour coaches,

bought at the same time as the East Fayette Street Bus Company.

4. A trackless trolley line, operating from a junction with two car lines to a point 6 miles away in the northwestern suburbs.

5. Four bus feeder lines, which act as auxiliaries to the street railway service in various sections of the city, there being an interchange of transfers between buses and cars.

6. All motor vehicle equipment of the various departments of the United Railways & Electric Company.

The services operated by the Baltimore Transit Company and the East Fayette Street Bus Company and the trackless trolley line are independent fare collecting institutions, producing a direct revenue. Most of the "railway bus lines" are not in themselves producers of revenue, their principal rôle being to lessen the expense of passengers carried in the territory they serve by relieving the company of the necessity of building and equipping railway extensions.

The Gray Line cares for that portion of the public interested in sightseeing, operates motor trips to points of interest near and far and cares for parties desiring chartered service for special tours. In this latter service there are also employed buses of the transit company, and the development of this class of business helps to solve the problem of idle equipment

in non-peak hours and on Sundays and holidays. Thus, buses which otherwise would have stood idle in garages when off scheduled routes earned during the first five months of 1926 a gross revenue of \$26,031 and a net income in the same period of \$2,554.

A concrete example of the usefulness of the bus in lightening the expense burden of the railway is shown in the case of the Montgomery Ward Company, which established a branch with approximately 3,000 employees in a section without adequate trolley service. A bus line with a twelve-minute headway service was installed at a cost of about \$30,000 a year less than would have been the cost of one-man Birney cars with double tracks.

Another instance of the same kind was in the case of a new real estate development about a mile from the terminus of a car line, where the realtors agreed to purchase a bus which would be operated at their ex-

Baltimore has never been considered a sightseeing city, such as is Washington, New York, Philadelphia or Boston, yet more than 10,000 passengers were carried on the company's city sightseeing trips during the twelve months ended June 30, 1926. Indeed, so great has been the increase of passengers on sightseeing trips in Baltimore since the company took over the operation of the Gray Lines that the Mayor of Baltimore has appointed a committee of citizens to work up a program of advertising and entertainment for visitors and to establish a municipal "visitors' bureau." An official of the company has been appointed to this committee, as the sole representative of the city's public utilities.

CHARTERED BUSES PROFITABLE SERVICE

The most profitable branch of the company's bus business is that of chartering buses. This business is done largely with single-deck buses, used also for regular



City Bus Used for Clearing Streets of Snow in Winter

pense by the Baltimore Transit Company. It was further provided that the transit company should credit the real estate operators with \$52 a year for each house built and occupied on the property after the date of agreement and should take over the entire bus operation when 800 houses had been constructed.

There is also a copartnership arrangement between the company and residents along the route of the trackless trolley under which the burden of the annual deficit of that line is shared by those residents. A bus line, in addition to those which have been mentioned, was inaugurated under a similar arrangement with a real estate developing company.

OUTINGS AND TOURS OFFICE FOR GIVING INFORMATION

A feature of building up good will for the company, as well as business for buses, is the outings and tours office established by the company in the heart of the city. At this office tourists and others can obtain answers to all sorts of questions, of which about half are for information on subjects not directly relating to outings and tours, such as ferry schedules, railroad schedules, steamboat schedules, local street car schedules, hotels, theaters, restaurants, and so on. This service is given by the Gray Line, which also operates the sightseeing tours in Baltimore.

line service. During the busy season, which is from April to October, an average of about fifteen of these buses are used for chartered business on weekdays and from 20 to 30 on holidays and Sundays. The maximum number of chartered buses on any one day has been 40, and sometimes the demand exceeds the available supply.

About 4,000 persons have taken the Gray Line tours from Baltimore to Washington and Mount Vernon, Gettysburg Battle Field, Atlantic City, Blue Ridge Mountains, Harrisburg and Susquehanna Valley, Philadelphia and Valley Forge, Annapolis and Naval Academy, etc. One form of this business is the handling of parties of tourists making combination railroad and boat trips and consists of the handling of a dozen to several hundred tourists with their baggage between railroad station and steamboat wharves, and vice versa. Usually a sightseeing trip through the city or to more distant points is included in these trips.

ADVERTISING THE BUS BUSINESS

In developing chartered bus business and business for bus or coach sightseeing tours some of the publicity has been of a unique and original character. One was a series of evening entertainments for civic and church organizations and community gatherings. The program on these occasions consisted of a "travelog," descriptive

of one of the regularly operated bus or coach tours. These travel talks, illustrated with stereopticon slides, were presented by one of the young ladies of the publicity department, who carried her auditors on interesting picture trips to Harper's Ferry, the Blue Ridge Mountains, Washington and Mount Vernon.

Talks of this kind have been presented, by request, before various religious, social and improvement organizations. Each of these talks meant a great deal of favorable publicity for the company's tourist business and also served to promote good will, as the remarks of the presiding officer in introducing the lady speaker invariably included an expression of appreciation of "the kindness of the United Railways, to which we are indebted for this evening's entertainment," or similar sentiment. Finally, the audience never failed heartily to voice its collective appreciation in the form of a resolution or vote of thanks, together with a request to "come again" at the conclusion of the talk.

Light Regulates Heating in Cars

WHILE El Paso usually has mild winters, the use of heaters in the street cars of the El Paso Electric Company is necessary during cold snaps. As these cold spells are intermittent and often of short duration, it is possible to make substantial savings in energy consumption by careful regulation of the heaters. To insure their most economical use, their operation is controlled by an inspector located at the dispatcher's room in the center of the city. Practically all cars pass this point. When heat is needed in the cars the inspector turns on a red light so placed that it can be seen easily from the platforms of passing cars. A thermometer on the outside of the booth is used to determine when the heaters should be used. Operators on the outlying lines and in shuttle service depend upon the chief dispatcher to keep them advised as to heating requirements. An account of this practice is given in the brief presented by the company in the 1926 Coffin prize competition.

Interstate Railway Adopts Symbol

TO DISTINGUISH its buses from those of its competitors the Interstate Street Railway, Attleboro, Mass., recently adopted a circular symbol bearing the letters ISR, as shown in an accompanying illustration. The use of such a symbol was considered particularly



Symbol Used by the Interstate Street Railway to Distinguish Its Rolling Stock from that of Its Competitors

desirable because of the existence of many interstate bus lines in the territory served by this company and the consequent lack of individuality in the name "Interstate." The same symbol is used also on the company's cars, on its letterheads and advertising copy. Mention of this is made in the company's Coffin prize competition.

Railway Employees Build Bus Garage

WITH the expansion of bus business during the past year it became necessary for the Interstate Street Railway, Attleboro, Mass., to provide better facilities for housing its vehicles. It was decided that the best location for a bus garage would be immediately



Garage of the Interstate Street Railway Is Conveniently Located Immediately Adjoining the Carhouse

adjacent to the existing carhouse. A structure 45 ft. x 60 ft. with concrete floor, cement block walls and a waterproof roof was designed. The railway company's own track, shop and line employees did all the actual construction work at odd times at an almost negligible cost for labor. The building was under the direction of a specially engaged boss carpenter who supervised the work of the railway men. The total cost of the garage, including labor and materials, according to the company's 1926 Coffin prize brief, was only \$4,944.75.

Prompt Daily Reports Guide Operations

IN COMMON with many railroads doing an interline freight business the Illinois Traction System formerly had no method of knowing quickly its daily earnings. The results of a month's earnings and operating expenses were not known until the monthly report was issued. This was usually not available until about the 25th of the month following. It then did not always reflect true earnings or the trend of business because of the large percentage of interline and intermediate business, the earnings from which are frequently very irregular in clearing between the railroads.

As the freight business of this road grew the need for an earlier and more definite record impressed itself more and more forcibly upon the management. The need for control of expenses and the necessity of making expenditures bear a proper relation to income also pointed to the need of a budget system and an accurate daily earning statement with an earlier monthly report. With this object in view, the control of expenses was secured by a simple budget plan based on estimates made by department heads. These estimates were then carefully analyzed and suitable budgets were allotted by the management, due consideration being given to probable earnings, condition of property and equipment, trend of labor and material costs, and previous operating and maintenance records. The budget allotments are approved for monthly periods and are usually planned from three to six months in advance, depending upon the season of the year, the character of the program and the department involved. These budget allotments are subject to revision only by the chief executive and as changing conditions warrant.

As a guide to the earnings of the system and as a means of controlling expenditures, a daily report has been formulated on the property. This is a summary of the daily records of approximately 100 station agents on the system and is quite accurate as far as the passenger and local freight earnings are concerned. The interline and intermediate earnings cannot be determined by the agents. To determine these last-named earnings daily in the office of the general auditor would require costly accounting and would delay the daily report. In 1925 the interline and intermediate tonnage on this road amounted to about 1,500,000 tons. It constituted more than one-half the system's freight business. An accurate method of forecasting these earnings was worked out by the freight auditing department by calculating division of earnings during certain test periods. Percentages were thus established which when applied to interline and intermediate total freight charges give an accurate estimate of the actual earnings. When very heavy special movements that may tend to disturb these percentages are handled such special movements are calculated separately.

Good results are mentioned in the brief presented

by the company in the recent Coffin prize competition. By this system the management has a daily report three days after the day's business. This report records accurately the passenger and local freight business and estimates very closely all interline and intermediate business by dollars, by carloads and by tons. The comparisons are made day by day, are cumulative by the month and by the year. The report shows the freight business divided by carloads and less than carloads, by local, interline forwarded, interline received, intermediate and switching movements. Four divisions of freight as to class are made as follows: Coal, grain, sand, gravel, stone, shale and like products, and all other car movements. The passenger business is divided as to cars and buses, and also between station agent ticket sales and conductor cash collections.

This daily report provides an accurate guide to the company's business both as to total earnings and as to the volume and class of business handled.

Substantial Schedule Signs Used at El Paso

NOVEL and inexpensive time-tables have been designed by the El Paso Electric Company to inform passengers concerning the schedule of the Ascarate Valley buses. The complete schedule was neatly painted

ASCARATE LOWER VALLEY BUS SCHEDULE LEAVES ASCARATE FOR		
EL PASO AND Intermediate Points	YSLETA AND Intermediate Points	FABENS AND Intermediate Points
6:20 A.M.	8:25 A.M.	8:25 A.M.
7:20 ..	8:25 ..	8:25 ..
8:20 ..	7:25 ..	10:25 ..
9:20 ..	8:25 ..	12:25 P.M.
10:20 ..	9:25 ..	2:25 ..
11:20 ..	10:25 ..	4:25 ..
12:20 P.M.	11:25 ..	6:25 ..
1:20 ..	12:25 P.M.	11:25 ..
2:20 ..	1:25 ..	• Last Bus Sat.
3:20 ..	2:25 ..	
4:20 ..	3:25 ..	
5:20 ..	4:25 ..	
6:20 ..	5:25 ..	
7:20 ..	6:25 ..	
8:20 ..	7:25 ..	
9:20 ..	8:25 ..	
10:20 ..	9:25 ..	
11:20 ..	10:25 ..	

Laurel S. Thorne, Gen. Supt. Tom E. Walker, Manager

Substantial but Inexpensive Schedule Signs Have Helped the El Paso Electric Company Popularize Its Intercity Bus Service

on a large piece of sheet metal. The lower edge of the metal was then imbedded in cement poured inside of an old tire rim and allowed to set. This forms a substantial base for the schedule, preventing it from being knocked over or blown over by a strong wind. A description is given in the company's Coffin prize brief.

Maintenance Notes

Safe Method of Splicing Armature Leads

SOMETIMES, in handling, the leads of an armature coil become broken and sometimes open circuits occur in the leads, while the coils remain in good condition. In such cases it is the practice of the Grand Rapids Railway, Grand Rapids, Mich., to splice out these leads. In doing this another piece of wire of the same size is lapped over the end of the lead and the two are wound carefully with fine copper wire. The entire joint is then brazed to form a tight connection. After the repair is made, the splice is taped carefully and an insulating sleeve is placed over the wire.

Previous to the use of this method it was the practice to use a small copper sleeve, which was placed over



Splicing Leads of Armature Coils by Winding with Copper Wire and Brazing

the ends of the two wires to make the joint. These were soldered in place. This method has been abandoned in favor of the wrapping with copper wire as this latter has proved much more satisfactory.



In Winding Armatures the Wire Passes from the Reel at the Right Through the Special Tension Device to the Coil Form Shown on the Left

Tension Device for Winding Small Armature Coils

WHEN winding small armature coils such as those used for compressor motors, with the usual type of tension device, the tension on the wire will vary as the winding form is turned or stopped. This is not only annoying to the operator but serves to decrease the efficiency in winding. In order to provide for uniform tension, a special tension device is used in the department of electrical repairs of the Brooklyn-Manhattan Transit Corporation. This device consists of a carriage that slides back and forth on a guide against the restraining action of two springs located on either side. The accompanying line cut shows the details of construction. The wire is

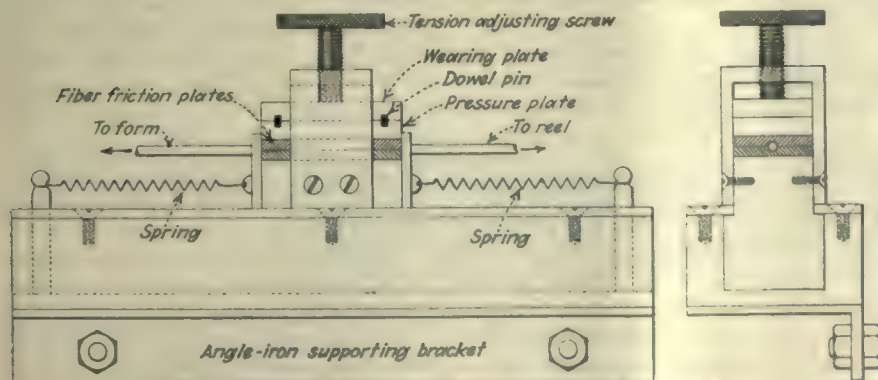
held between two plates, the pressure on which is adjusted by means of an adjusting screw. Fiber friction plates are used next to the wire. A reel of wire is attached to the bench at one end and after passing through the tension device goes to the coil form.

As necessity is the mother of invention, so's good lubrication your "old man" of prevention.

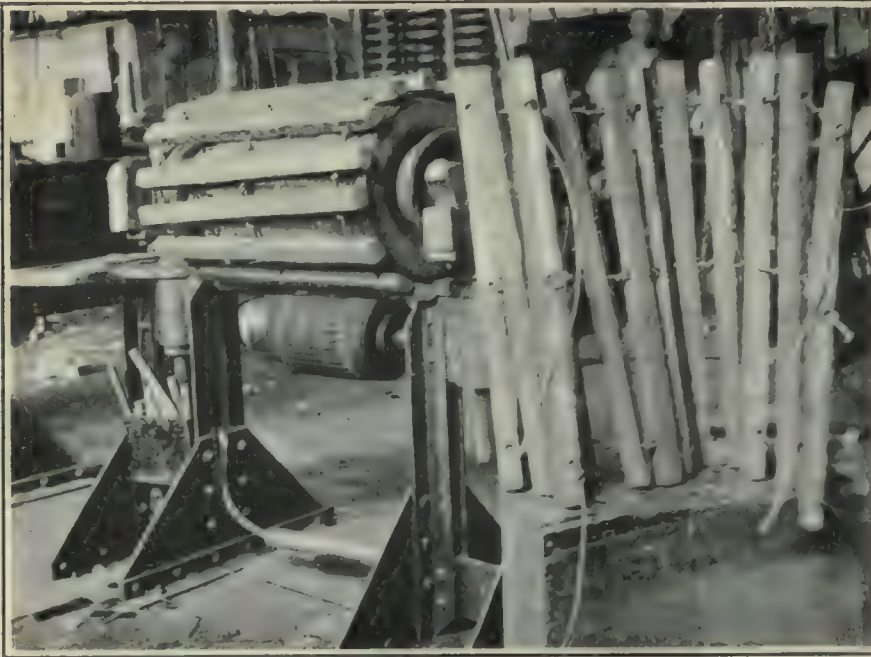
Wooden Protective Blanket for Armatures

SAFELY transporting armatures from point to point has always caused the armature department of the electric railways a considerable amount of worry due to the possibility of coil or commutator injury. To overcome this danger the New York Railways developed a wooden protective blanket, which since its adoption has decreased materially coil and commutator injuries during transportation and handling.

This blanket has strips of maple wood 1 in. x 2 in. with sufficient length to cover vital parts, laid equally spaced in parallel and securely roped together. Holes $\frac{1}{2}$ in. in diameter are bored through the 2-in. dimension of each strip about



Details of Tension Device with Coil Springs on Either Side



Wooden Protective Blankets as Installed on an Armature and Ready for Use

6 in. from either end and at the center.

A sufficient number of strips to encase entirely a desired armature and spaced about $1\frac{1}{4}$ in. are threaded on three ropes and the ends left long enough to permit making a secure knot when the completed blanket is installed on an armature. The $1\frac{1}{4}$ -in. spacing of strips is accomplished by

making a simple knot in each rope between strips so as to keep them apart.

This blanket has not only decreased the mechanical injuries to coils and commutators during transportation and handling but it has also practically eliminated the rolling about of the armature during transportation if not securely blocked.

Overhead Maintenance Kinks in Baltimore

Important Savings Made in Cost and Minutes Delay from Breaks—New Apparatus for Draining Manholes and Locating Cable Faults—Carhouse Conductor of Tire Steel

THE United Railways & Electric Company of Baltimore has reduced its trolley breaks per year continuously for the last six or eight years so that the number in 1918 of 1,321 was brought down in 1925 to 56. Concurrently, there has been a decrease in the delays to cars due to power trouble. Thus 1925, as compared with 1924, shows a reduction in number of delays due to this cause of 61.4 per cent and in number of minutes delay of 48.9 per cent. An organization of patrol inspection crews is responsible, the company believes, according to its 1926 Coffin prize presentation.

In the plan followed, the system is divided into four sections with an inspector assigned to each, and his entire time is spent in patrolling this section and reporting to the emergency dispatcher all necessary maintenance work. This work is assigned to the various overhead maintenance crews, who keep in frequent tele-

phonic communication with the dispatcher so as to be available immediately for emergency work. Except during peak hours, when all crews are held at their various stations, one crew is held as standby at division headquarters for answering fire, accident and other emergency calls. The remaining crews of both day and night shifts are kept on the street occupied in inspection and maintenance.

The present operating force of the emergency division consists of six truck crews on each of the day and night shifts and one line car crew on a suburban division. Each crew consists of a lineman, a chauffeur and a helper. As the overhead system has now been brought to an excellent operating condition, it is believed that a reduction in the maintenance forces can be made without detriment. The reorganization plan provides for the elimination of one of the day crews, two of the night crews and the line

car crew. As most of these men, from previous experience, are capable as motormen or chauffeurs, they are to be transferred to other departments of the company where suitable vacancies exist, without personal loss to them by reason of the reorganization scheme. It is estimated that a net saving in labor and truck operation expense of about \$28,000 yearly can be made by this change.

All of the overhead construction trucks are now motor-driven. The use of motor trucks instead of horse-drawn trucks permitted the company to reduce the personnel of the division from 43 to 26 men. Nevertheless, approximately 25 per cent more work was accomplished by the smaller number of men.

DETECTING CABLE FAULTS

The company is now using a capacitance bridge with microphone hummer to determine the location of the fault when a cable fails and the conductors are burned in two without grounding. It was virtually impossible to locate the fault either with the time-honored slide wire bridge or the exploring coil method. With the new instrument the fault is readily located by measuring the capacitance of the several conductors and computing the distance from office records, giving the per foot capacitance value of the cable. The old way of locating such a fault was by cutting the cable a number of times until the faulty section had been segregated, a method which was both costly and slow. The new instrument was purchased from a company which developed it for measuring the capacitance of telephone circuits, and it is said that this is the first time the instrument has been used by an electric railway or power company to adopt it for locating faults in power cables.

PUMP FOR DRAINING MANHOLES

To expedite the work of maintaining the 1,500,000 ft. of underground cable in service, a 3-in. centrifugal pump was installed on the front end of a 2-ton truck during the month of March, 1926. The pump is driven by the truck motor through a power take-off connected to the crankshaft. An electric starter was installed on the motor to do the cranking, but if it is necessary to start the motor by hand, the front end of the pump shaft is adapted to take the hand crank.

An automatic primer connected to the intake manifold of the motor supplies a simple and quick method of priming the pump. Two sections of

special smoothbore suction hose, each 15 ft. long, are carried on the truck and are used coupled together when the truck cannot be placed near the manhole. The capacity of the pump is 250 gal. per minute and it has proved to be very efficient in draining manholes, as well as in other maintenance and construction work.

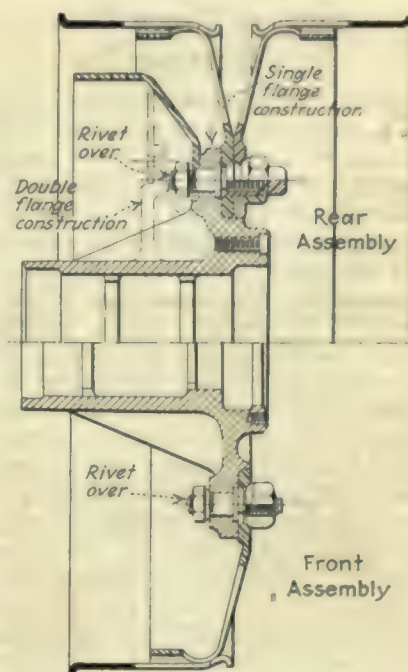
NEW CARHOUSE CONDUCTOR

A new type of rigid contact overhead conductor has recently been installed in the carhouses of the company to overcome the problem presented by frequent crystallization of the wire at the ends of the ears and the burn-downs or pull-downs resulting from frequent shifting of cars by shop men.

The material used for the new type of conductor is $\frac{3}{4}$ -in. by 2-in. tire steel, which has one edge suitably rounded. It is supported by standard insulated clevis hangers, spaced 10

ft. apart in straight line work and 4 ft. apart in curves and special work. The tire steel, which is obtained in 30-ft. lengths, is mounted with adjacent sections held in alignment by two $\frac{1}{4}$ -in. by $\frac{1}{4}$ -in. by 10-in. straps, bolted and welded to the conductor. Frogs and crossings are bolted to the trolley trough, and the end of the tire steel conductor, where it enters these fittings, is so dressed as to provide a smooth under-run. Entrance under fire doors is effected by an insulated runner fastened to the bottom of the door, which provides a smooth under-run and permits ready lowering of the door.

A crew of three men with a line car will install an average of over 150 ft. of conductor a day, including mounting of supporting hangers. The conductor is neat in appearance, rugged in construction and easy to install and it will outwear the ordinary trolley wire many times.



Section Showing Double Cap-Nut Method of Mounting Dual Rear Wheels

is stated that elimination of worn holes and sheared or broken studs is accomplished through this design.

New Equipment Available

Double Cap-Nut Method for Mounting Dual Wheels

DUAL rear wheels for buses can be mounted by an improved method announced by the Budd Wheel Company, Detroit, Mich. This is termed the double cap-nut method. With it each of the dual rear wheels is driven by an individual set of nuts. The original Budd dual wheel method of mounting was by means of a single nut through which both inner and outer wheels were driven. By this design the inner wheel of a dual assembly was in reality driven by the friction or clamp action between the outer wheel and the hub flange. With

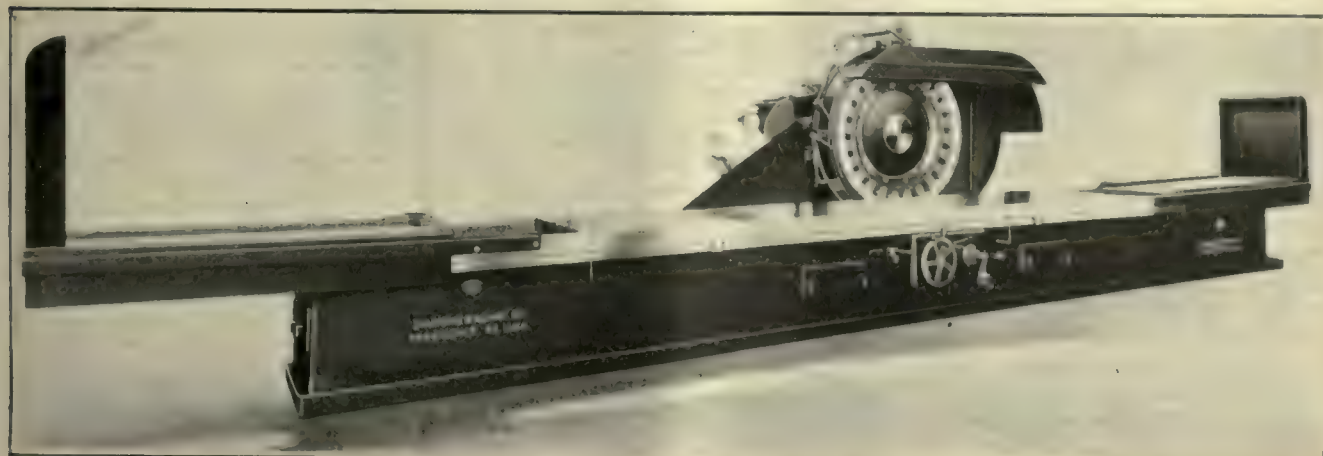
the advent of larger and heavier buses, improvements in the method of mounting became necessary as tires up to 7 in. and 8 in. are required to carry the load.

The principle of the Budd method of driving wheels remains unchanged from the original design. The wheel stud holes are larger than the studs themselves and are counterbored cup shape. The bored face of the cap nut fits into this counterbore. The design provides the nut with a great area of contact against the wheel. Right and left-hand studs, used on the respective sides of the vehicle, contribute to keeping the nuts tight after they are properly drawn up. It

Face Grinder for Frogs

WHERE flat surfaces are required in grinding track frogs and for similar purposes a large face grinder has recently been developed by the Diamond Machine Company of Providence, R. I. The machine is claimed to reduce greatly the time necessary to grind a frog satisfactorily. It is operated by a 75-hp. motor. Work up to 198 in. long and 48 in. high may be taken by this machine.

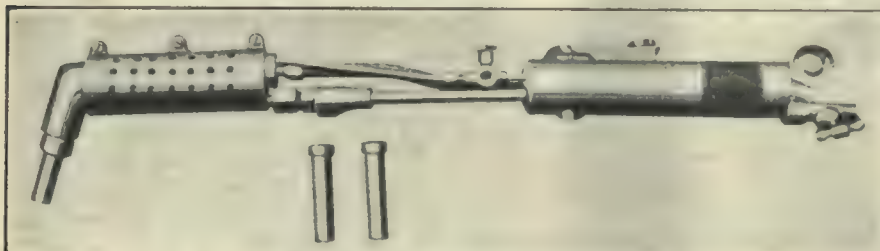
The table may be operated at a maximum speed of 30 ft. per minute. Machines are built in various sizes, 18, 30, 36, 54 and 66 in. diameter, and in various lengths.



Large Face Grinder for Finishing Track Frogs

Cutting Torch Uses Illuminating Gas

RESULTING from extensive experiment and research in the utilization of a cheaper fuel for metal cutting is the gas cutting torch for use with illuminating and by-product gases, recently placed on the market by the Alexander Milburn Company, Baltimore, Md. Economies in fuel cost of themselves reduce cutting costs materially, and in addition the company claims that features of the new torch cause it to give better penetration into the metal, a narrower kerf and sharp, clean edges, as well as speedy and smooth cutting with a notable absence of metallic slag on the underside of the cut. Nor does the new torch case-harden the surfaces cut, it is stated, the surfaces being left in practically the same state as the original steel. With city gas costing approximately 1/30th that of other gases, the item of saving in this one direction is important. An outstanding feature of the



This Cutting Torch Uses Illuminating Gas

Milburn torch is the superheater which heats and expands the cutting oxygen, also the preheating of the gases, raising the temperature of the cutting oxygen to approximately 100 deg. C. prior to combustion. This increases the temperature of the gases at the torch tip, increases the rate of flame propagation in the burning mixture and reduces the oxygen consumption from 25 per cent upward.

The torch is ruggedly constructed of bronze forgings and specially drawn tubing. The high-pressure cutting oxygen is controlled by a thumb valve which remains fixed in either open or closed position. The arrangement of the gas tubes gives the torch great transverse strength. The torch is 21 in. long and is supplied with a complete range of tips for light, medium and heavy cutting. Heavy plate and slabs, risers of steel castings, structural shapes, gates, billets and other heavy cutting work may be handled with this gas torch, the Milburn company states.

C.E.R.A. Winter Meeting Feb. 4-7

THE Central Electric Railway Association will hold its annual winter meeting at Toledo, Ohio, on Feb. 3 and 4, at the new Commodore Perry Hotel. Members are looking forward to this meeting as a banner gathering because, at the same time, the executive committee and also several of the American committees of the American Electric Railway Association will meet in Toledo.

Official announcements have not yet been made, but one of the preliminary entertainment features will be the banquet to be held on Thursday evening in the main assembly room of the hotel.

The date of the convention has been proposed for this time in order that the activities might be held at the Commodore Perry because of the excellent facilities. There are a number of large committee rooms; and the assembly

room is provided with a stage, a moving picture booth, and also amplifiers.

This convention will immediately follow the Ohio Bankers Association and will be the second one on record at the new hotel. Delegates are urged to make their reservations early.

Regular Meeting Central Traffic Association on Nov. 17-18

CENTRAL Traffic Association will hold its next traffic meeting at Fort Wayne, Ind., on Nov. 17 and 18 at the Keenan Hotel. The opening session at 9 a.m. will be in the nature of a round-table discussion.

Hotel reservations should be made either through J. A. Greenland, superintendent of traffic and transportation Indiana Service Corporation, or through the Hotel Keenan direct.

Special Bulletins Available

FOLLOWING is a list of special reports which have been prepared by the Bureau of Information and Service of the American Electric Railway Association and which are available to member companies upon request:

Bulletin No. 111. Analysis of Electric Railway Franchises, Part I. This is an identical analysis of twelve franchises recently granted to electric railways under the following main subjects: General Terms; Public Control; Fares; Regulation

of Service; Finances, Capitalization and Accounts; Regulations Governing Companies' Use of Streets. Part I covers the first three subjects mentioned, namely, General Terms, Public Control, and Fares.

Bulletin No. 112. Motor Bus Decisions. This is a collection of court and commission decisions regarding motor vehicle common carriers made since the issue of Bulletin No. 26—Motor Bus Decisions, June 1, 1925. It covers all decisions under existing motor bus laws handed down by the United States Supreme Court, the state supreme courts, and the various state public utility commissions. Included in the range of the decisions are such subjects as jurisdiction and powers of commissions, issuance of certificates of convenience and necessity, abandonment of service, extension or modification of routes, service requirements, rate structures, etc. The decisions are preceded by an analytical index, making possible ready access to decisions on all phases of motor vehicle operation.

Bulletin No. 113. Relative Seniority of Electric Railway Trainmen and Bus Operators. A collection of extracts from electric railway labor agreements covering the question of seniority of bus operators and trainmen, and the rating of trainmen who break in as bus operators.

In addition to the above the following supplements have been prepared, bringing the information they cover down to Nov. 1, 1926:

Supplement No. 14 to City and Interurban Fare Bulletins Nos. 41 and 42.

Supplement No. 1 to Bulletin No. 108, Wages of Trainmen.

Supplement No. 1 to Bulletin No. 109, Wages of Busmen.

Cost of Living Studies (Bulletin No. 114).

COMING MEETINGS

OF

Electric Railway and Allied Associations

Nov. 9-12—National Association of Railroad and Utilities Commissioners, annual convention, Battery Park Hotel, Asheville, N. C.

Nov. 11-12—American Institute of Electrical Engineers, regional meeting, Engineering Societies Building, New York City.

Nov. 16-18—Society of Automotive Engineers, National Transportation and Service Meeting, Boston, Mass.

Nov. 17-18—Iowa Electric Railway Association, operating and maintenance section, annual convention, Fontanelle Hotel, Omaha, Neb.

Nov. 17-18—Central Electric Traffic Association, regular meeting, Fort Wayne, Ind., Keenan Hotel, 9 a. m.

Dec. 3—American Electric Railway Association, Metropolitan Section, Engineering Societies Building, New York City, 8 p.m.

Dec. 6-9—American Society of Mechanical Engineers, annual meeting, New York City, Engineering Societies Building.

Feb. 3-4—Central Electric Railway Association, winter meeting, Toledo, O., Commodore Perry Hotel.

The News of the Industry

Action Urged at Once

Mayor's Message to City Council Seen as Spur to Chicago Subway Construction

Breaking a silence on traction matters that has persisted since the defeat of his ordinance in April, 1925, Mayor William E. Dever of Chicago delivered a message to the City Council on Nov. 3, in which he strongly recommended that the city begin at once the construction of a system of downtown subways. It was, of course, known he had been following the negotiations for a new traction ordinance with great interest, but the Mayor's sudden action surprised the Council, by which the remarks are regarded as a final effort to put through a subway plan before his term of office expires next spring.

The message is obviously intended to separate the subway question from the complicated negotiations now in progress between the city and local traction interests for a unification, terminable permit ordinance and with the Harlan-Lisman interests, New York, for a twenty-year Surface Lines franchise. The Mayor made it clear, however, that he does not desire any interruption to this work. He declared:

On the contrary, these negotiations should be prosecuted with the utmost diligence. These phases of the problem are equally important and must be solved before anything like adequate transportation can be given all portions of the city.

Mayor Dever assured the Aldermen that he fully appreciated the difficulties involved in the situation and did not purpose to criticize them for failure so far to obtain a solution.

The main features of the Mayor's plan, as outlined in his message, are as follows:

1. Selection at once of the type, location, and engineering plans for subways, using as a basis the recent report of the citizens' advisory committee.
2. Submission of the plan in a referendum, as required by Illinois statutes, at a general or special election, possibly the election in April, 1927.
3. Judicial confirmation of special assessment proceedings, again using the citizens' advisory committee report as a basis for negotiations.
4. Operation of cars, either by the city through an arrangement with the surface and elevated lines, with a transfer arrangement; or direct rental of the tubes to the companies.

The plan of the citizens' advisory committee, which was referred to in the *ELECTRIC RAILWAY JOURNAL* for Aug. 28 last, calls for a low four-track tube for "L" cars in State Street from North Avenue south to Roosevelt Road, and a high level, two-track Loop subway for surface lines cars east of the Chicago River under Washington and Jackson boulevards, connecting at Michigan Avenue.

At \$5,600,000 a mile, this system would cost approximately \$32,500,000,

about one-half of which would be raised by special assessments. These assessments might be voluntary, the committee suggested, thereby avoiding long litigation.

Mayor Dever stated concisely that the "city should own and control all subways." There is "no reasonable possibility," he asserted, "that either the surface or elevated lines could finance subways without increasing their fares."

He believes that the example of other cities where near-by property owners have borne a large portion of the cost should be followed in building subways for Chicago, in addition to utilizing the city's \$45,000,000 traction fund. He said:

The only subway construction possible under present financial limitations would be a subway of limited extent, so located as to render a maximum service to the greatest number of our citizens.

Construction of subways in the central business district, by relieving traffic congestion, will inure to the benefit of all who use the transportation system, whether or not they actually travel through the subways.

In view of the Mayor's substantial following in the City Council and the urgency of his plea, it is believed that the message will go far toward clearing up the present maze of discussion centering about the transportation situation and tend to draw at least one phase of it—subways—out into the spotlight for early and specific disposition.

Traffic Regulatory Ordinance Passed in Baltimore

Mayor Jackson on Oct. 28 signed the most drastic ordinance on city-center parking which has ever been passed by the City Council of Baltimore. The new law becomes effective immediately. Under it, motorists must move their cars from congested downtown streets at 4:30 o'clock in the afternoon. From that time until 6 o'clock all parking in the city center is prohibited.

The measure was signed despite considerable protest, and the step is regarded by municipal authorities as the only solution available to the traffic problem.

Representatives of the Maryland Automobile Club, the Automobile Dealers' Association and many merchants' organizations opposed the plan, saying it would hurt business.

This newest ordinance is supplementary to the ordinance passed by the City Council on Sept. 27 after Baltimore motorists had enjoyed five days of unrestraint following the invalidation of the city's traffic laws by a court decision. In that case the court held that the Police Commissioner had no power to enforce the traffic rules he had promulgated by virtue of the powers vested in him by the State Legislature. As a result, Baltimore was left without traffic regulation from Sept. 24 to Sept. 26.

Votes Affect Utilities

Election Results Have Slight Bearing on Railway Industry—Commissions Target of Attacks

In at least eight states of the country the results of the elections on Nov. 2 had a more or less direct bearing on the light and power industry or the development of water power. However, these results had little bearing in the main on companies that are operating in the electric railway field.

In Colorado the proposed amendment to the public utilities commission law bringing under commission jurisdiction all public utilities except those municipally owned, thus abolishing the "home rule" feature of the present law, was defeated by a majority of two to one.

Governor A. V. Donahey of Ohio, Democrat, was re-elected for a third term by a small majority. He had been waging war with a Legislature of the opposite party over the personnel of the Public Utilities Commission. This war, which has culminated in a commission composed of two hold-over members and a third whose term will expire in February, will, the Legislature being once more Republican, presumably go on. One of the charges of the Governor is that the commissioners show undue favor to certain utility companies.

In Maryland Governor A. C. Ritchie has been re-elected. He was attacked for his support of the plan for the development of the hydro-electric plant at Conowingo as it was finally approved by the Public Service Commissions of Maryland and Pennsylvania and the Federal Power Commission.

COMMISSION ISSUE IN KANSAS

In Kansas a fight was waged around the Public Service Commission. The Democratic nominee for Governor, former Gov. Jonathan M. Davis, conducted his campaign on the issue of forcing public service companies to pay taxes on the same valuations used for rate-making purposes. During his term of office Mr. Davis helped to raise the valuations of utility companies \$153,000,000 for taxation purposes. In most instances tax payments on such valuations were made under protest and the affected companies succeeded in having the courts enjoin the tax commission from further collection on the increased valuations. An attack on the commission and the utility companies failed to win the support of the voters, Governor Paulen, who had been renominated by the Republicans, winning readily.

The election for United States Senator in Illinois was of interest to the utility companies because of the attacks made on candidates who accepted contributions to their primary campaign

expenses from Samuel Insull, president of the Commonwealth Edison Company of Chicago. It was revealed by the Senatorial committee of investigation that the successful Republican candidate for the nomination, Frank L. Smith, then chairman of the Illinois Commerce Commission, accepted \$125,000 from Mr. Insull and the Democratic nominee, George Brennan, \$15,000.

This disclosure was largely responsible for the nomination of a third ticket by independent Republicans, who chose H. S. Magill as their candidate. The latter failed to poll a very large vote and Mr. Smith won over his opponent by a good plurality, but one much under the normal.

Fares on New Basis in Jamestown

The weekly pass entitling the holder to an unlimited number of rides on cars and buses of the Jamestown Street Railway, Jamestown, N. Y., and the Jamestown Motor Bus Transportation Company went into effect on Nov. 1. The pass sells for \$1. On the same day, the new fare schedule on cars and buses in Jamestown went into effect. The new cash fare is 10 cents on buses or cars, but tickets may be purchased at the rate of three for 25 cents or ten for 75 cents. The new rate provides for interchangeable transfers from bus to car or from car to bus. The new fare from Jamestown to Celron or from Falconer to Ashville on the interurban division is 20 cents. Some changes in car routings also have been made on the local lines in Jamestown.

Claims Philadelphia Loss \$4,000,000 in "L" Lease Terms

The Pennsylvania Public Service Commission considered a list of objections in City Hall, Philadelphia, on Nov. 4 to the proposed 30-year extension of the Frankford Elevated lease. Harold M. Evans, a former member of the Public Service Commission, acting as counsel for the City Club, pointed out that under the proposed amendment of the Frankford lease the city would receive in rentals from the Philadelphia Rapid Transit Company nearly \$4,000,000 less than the total rentals payable under the original lease, if extended. There were many lively tilts at the hearing. Former Mayor Moore, who appeared as a witness, declared that the extension of the elevated lease to the Philadelphia Rapid Transit Company was a mere surrender by the city of its rights. City Solicitor Gaffney, President W. K. Myers and H. M. Evans argued over the difference between "equal to" and "equivalent to." At the close of the hearing Commissioner Beamish said he desired Mr. Myers to furnish at the next hearing, on Nov. 18, an explanation of what the Philadelphia Rapid Transit Company meant by "equal to" and "equivalent to" in reference to interest charges on city bonds.

The Mayor's recent approval of the "L" extension lease and the terms embodied in that agreement were referred to in the *ELECTRIC RAILWAY JOURNAL* previously.

Decision Reserved on Locomotive Inspection Order

As a result of an order of the Interstate Commerce Commission to appear and show cause why interurban electric railways should not be included among roads required to conform to the rules and instructions for the testing and inspection of locomotives other than steam, a meeting and hearing was held in Washington, D. C., Oct. 31 and Nov. 1. In order to arrange the information to be presented at the formal hearing a preliminary meeting of engineers and counsel was held at the A.E.R.A. headquarters in Washington, D. C., Sunday, Oct. 31. The rules and instructions of the Interstate Commerce Commission for the inspection and testing of locomotives other than steam were gone over very carefully and suggested changes in a large number of the rules were agreed upon. In the absence of Judge Ralph R. Bradley, chairman of counsel, C. D. Cass acted as chairman for the meeting. Harley A. Johnson was chairman of the engineering committee. Other members present were S. H. Anderson, J. M. Bosenbury, R. H. Dalgleish, H. J. Graham, V. R. Hasty, Guy C. Hecker, C. L. Henry, W. F. Howard, E. S. Johnson, Frank Karr, R. E. Quirk, C. W. Squier, D. F. Smith, Fred E. Stout, Charles E. Thompson and C. C. Whittaker.

The meeting held on Nov. 1 was before Examiner Rogers of the Interstate Commerce Commission. At this time argument was presented to show why, in the opinion of counsel for the electric railways, interurban roads should not be included in the order. Without in any manner waiving the rights of the electric railways, they were also requested to submit changes that they considered necessary in the present rules. To comply with this Harley A. Johnson took the stand and presented a list of the various changes in the present rules and instructions for inspection and testing of locomotives other than steam which had been

agreed upon as requiring changes in order to conform with present electric railway practice. Decision in regard to the findings will be made later.

St. Louis Postpones Action on Fare Request

City Counselor Muench of St. Louis, Mo., on Oct. 26 filed with the Missouri Public Service Commission at Jefferson City, Mo., the city's answer to the petition of Rolla Wells, receiver for the United Railways, asking for an immediate temporary increase in fares. Counselor Muench asks that no increase be given the company until the city has been heard and until the issues raised in the company's original petition for an increase have been determined. While the city's answer does not specifically oppose the latest petition of the railway, it in effect asks for a postponement of action until the time the commission would have acted on the original petition for an increase from 7 cents to 8 cents or two tokens for 15 cents. The original application for a raise in fares was filed in June.

Changes Sought in Operation in Elizabeth

Proposed changes in the transportation service at Elizabeth, N. J., to provide for a single-fare ride between the eastern and western parts of the city were agreed upon recently at a conference between the Board of Works and the City Plan Commission.

The plans call for the following recommendations to the Public Service Railway:

Restoration of the former system of railway operation by rerouting the Roselle Park cars through Elizabeth Avenue to the Elizabethport section and the Morris Avenue cars to the terminal at Bayway.

Extension of the El Mora bus line down Elizabeth Avenue to Union Square.

Establishment of a new bus route to furnish transportation between downtown and Wanamanco Park.

Extension of the Edgar Road and Irvington bus lines over loops east of Broad Street to relieve congestion now caused by their present terminals.

The City Plan Commission also advanced a suggestion that a crosstown bus line be established to furnish single-fare service between the El Mora and Kellogg Park sections.

Hearing Put Over on Buffalo Fares

The New York State Public Service Commission has adjourned from Nov. 8 to Nov. 22 the taking of testimony on the application of the International Railway, Buffalo, for permission to increase its fares from 8 to 10 cents in the city of Buffalo. Commissioner William R. Pooley explained the adjournment was made necessary because the accountants have not completed their work on the books of the railway. Dr. Milo R. Maltbie has been retained by the city of Buffalo to oppose the company's application for higher fares. It is said that the city hopes the figure of \$22,000,000, fixed by the commission in a previous proceeding, will be used as the basis of the commission's computation of a reasonable rate in Buffalo. The city is not asking for a reduction of the present 8-cent fare.

A New Idea in Regulation

In appointing C. J. Golden to the Public Service Commission of Pennsylvania Governor Pinchot said:

This appointment was offered to Mr. Golden not only because of his wide experience in the class of questions which come before a Public Service Commissioner, but more especially because he will represent the rights and interests of the plain people of this Commonwealth.

The working people of this State ride in the trolley cars and they are entitled to have a representative in the body that determines the amount of fare they must pay. Mr. Golden will give voice to the needs of the great mass of our workers who have hitherto been without representation on the commission.

The domination of the majority of the present commission by the public service corporations makes it especially important that every vacancy should be filled by a man who will be actively on the side of the people.

Only a few days before this the Governor named Richard J. Beamish for appointment to the commission to represent, as he said, exactly the opposite point of view to that of the utilities.

De Luxe Cars Placed in Service in Chattanooga

The ten new railway coaches purchased by the Tennessee Electric Power Company, Chattanooga, Tenn., early in the year representing an investment of \$150,000, were introduced to citizens of Chattanooga on Oct. 19.

The new coaches were assembled at Sixth and Broad Streets at 1:30. At 2 o'clock the coaches moved up in order and stopped in front of the Chamber of Commerce building. A fifteen-piece band was ready to lend a festive air to the occasion. E. D. Reed, manager of the Chattanooga district of the company, formally presented the new coaches to Commissioner Fred Frazier, representative of the city. After the preliminaries in the way of two or three short speeches the coaches were loaded to capacity for the maiden trip through the downtown sections.

City and county officials, directors and representatives of the chamber of commerce and the manufacturers' association, civic club delegates, press representatives and others were invited to be guests of the company on this occasion.

Led by the new coach "Chattanooga," which was on display at the recent American Electric Railway Association convention, the route of travel was south on Broad to Ninth, north on Market through the transfer station at Fifth Street, south on Market to Main to Central Avenue and return. Walter Cline took moving pictures of the parade. All ten coaches went into regular service on Wednesday morning.

The new coaches cost \$14,600 each. They seat 45 passengers as compared with 36 to 40 on the present cars. They weigh 28,000 lb., or 14 tons, and are lighter than those now in use.

The following names have been given the coaches: "Chattanooga," "Chickamauga," "Missionary Ridge," "Sherman Heights," "Orchard Knob," "Fort Wood," "Cameron Hill," "Lookout Mountain," "Signal Point," "Cravens House."

A Lone Battler for the Right in St. Louis

R. B. Brooks, director of streets and sewers for St. Louis, Mo., debated single-handed against 50 men and women who appeared on Oct. 20 before the Aldermanic committee on streets, sewers and wharves to protest against the plan of the Board of Public Service to segregate street cars from other traffic when Olive Street is widened between Twelfth and Grand Boulevards. Mr. Brooks coolly marshaled facts and statistics, vouched for by experts from other cities, to uphold his contention in favor of the segregation plan.

The protestants, led by Lee Orcutt, secretary of the Greater Olive Street Association, based their opposition solely on their personal interests, disregarding the fact that 95 per cent of the users of Olive Street ride in the street cars and that a large portion of the cost of the improvement will be paid from bond issue funds voted by the city at large.

Director Brooks pointed out that if the present bill is killed by the Aldermen it will require at least another

eleven months to bring a new measure up to the same legal status and in the meantime about 40 ft. on the south side of Olive Street for more than 2 miles would be filled with half-wrecked buildings, greatly depreciating values.

Real estate men who opposed the measure contended that the parkway would tend to decrease property values along the street.

Atlanta Cars in Merchandising Feat

Railway cars of Atlanta, Ga., played a big part in an advertising scheme introduced by the J. M. High Company at the recent 44th anniversary sale of that store. Thirteen cars of the Georgia Railway & Power Company were chartered and operated from the ends of thirteen main arteries of traffic between 8 o'clock and 10 o'clock on the morning of the opening day. Signs were hung on each of the cars inviting the shoppers and housewives to get aboard for free transportation. Wide publicity was given to the plan by the daily papers, which printed schedules for the bargain seekers.

Through a Motorman's Window

HOW simple are the duties of a motorman! All he has to do is to pilot his car through the mazes of down-town traffic and get back to the end of his run on time, with no passenger hurt or angered, no pedestrian scathed, no automobile jammed and his own ponderous vehicle unscratched.

Nobody has a kind word for the motorman. If a jaywalker gets in his way and is clanged at, the motorman is to blame. If a motorist gets in the way of a street car, the motorman is at fault. If a passenger arrives after the car starts or gets carried by a stop or is swayed against a neighbor by a quick application of the brakes, no one but the motorman is responsible.

The inflexibility of street cars in traffic is a factor too often overlooked in the consideration of congestion. A street car cannot dodge; cannot detour around an obstruction. The motorist who acts the grasshopper, gets out of line and into the car track may hold up 60 passengers merely to save a few seconds for himself. The driver who deliberately pulls in front of a car, knowing the motorman will not hit him if he can help it, does the whole brotherhood an injustice.

Blaming one's own faults on the motorman does not help solve the traffic problem. It is merely an index of one's own folly. The constant wonder is not that an occasional automobile is nipped by a street car but that such accidents occur so seldom. Behind a motorman's window is a good place to study highway foibles. The urban world passes in jumbled panorama outside.—*Cleveland Plain Dealer.*

Big Brother Club Hears Words of Wisdom

School boys and girls of Boston, Mass., have again been warned by Edward Dana, general manager of the Boston Elevated Railway, of the dangers incident to their going and returning from school. Over the radio on Oct. 22 he addressed the Big Brother Club and offered some statistics on the results of their co-operating with the conductors and motormen last year in avoiding accidents. He said that as far as the Boston Elevated was concerned only 59 instances were recorded during the past twelve months of children under 14 years of age injured while stealing rides on cars or being struck, compared with 85 for the previous year.

Memphis Railway Claims Right of Discipline

In a bill filed against the Amalgamated Association, the Memphis Street Railway, Memphis, Tenn., recently sought a judgment of the Chancery Court on the company's right under the existing contract to discipline its union carmen. A difference between the company and the men is that the latter claimed the matter should be submitted to arbitration, while the company claimed that the first clause in the contract, signed as of April 1, 1926, gives it this right. The union questioned the propriety and justice of this discipline and demanded arbitration. The company is asking the court to construe the terms of contract. If the court so rules the company will submit to arbitration. In this event, should the arbiters hold that the men suspended recently have been dealt with unjustly, the company has agreed to reinstate them with pay for time lost.

Pedestrians May Go and Stop on Signal

It is expected that stop and go signals for pedestrians will be adopted if the recently completed traffic survey of the Association of Commerce is approved by the City Council of Chicago. The preliminary statement said that the "hodge-podge intermingling of scampering pedestrians and slow-moving honking vehicles" caused a "chaotic condition" calling for "adequate treatment." Miller McClintock, director of the survey, said that thus far the pedestrian had been left to follow his own inclination, but that the time had come when all classes of street users had to be regulated if vehicles were to move faster and pedestrians be protected.

A count made by Mr. McClintock and his assistants on a typical Saturday last May showed 195,930 persons crossed State and Madison Street intersection between noon and 5 o'clock, 49,250 pedestrians an hour. It was his belief that this huge flow of traffic, not protected or regulated, resulted in a wild scramble of pedestrians and a retardation of vehicles. According to the survey in that fashion an average of 1,000 persons a block cross loop streets at the noon hour.

Ten-Mile Electrification Planned in Seattle

The Chicago, Milwaukee & St. Paul Railway plans to electrify 10 miles of its main line between Seattle and Black River Junction in Washington, over which steam trains are now being operated. The work will cost \$250,000 and is expected to be completed within four months. The improvement will speed up service, as it will be possible after the change to run the electric locomotives into Seattle, eliminating delays incident to the change from steam to electric propulsion at the junction.

Commission Has Fresno Case

Mooted questions in Fresno, Cal., were aired before the Railroad Commission on Oct. 25, with the result that Commissioner T. H. Louttit took under advisement both the increased fare issue and the extension of the lines of the Fresno Traction Company to the Fink-Smith district. The Fresno Traction Company applied early in the present year to the Railroad Commission for an increase in its present 6-cent fare rate, alleging that it had operated at a loss of \$4,056 during 1925. The commission first set the application for hearing on June 1 before Commissioner Brundige at Fresno, and intended to consider at the same time the complaint of the city of Fresno to require the utility to extend its tracks to the Fink-Smith district.

News Notes

One-Man Cars on Another Interurban.—In order to maintain the present high standard of service on its interurban line between Sheboygan and Elkhart Lake without increasing fares or curtailing service, the Wisconsin Power & Light Company has put new one-man cars into service.

Cash Fare Raised in Fort Dodge.—After operating its bus line for a year at an 8-cent cash fare, the Fort Dodge Transportation Company, Fort Dodge, Iowa, has found that a higher revenue is necessary in order to show a profit, and the City Council has authorized the company to increase the rate 2 cents. The new fare went into effect on Nov. 1. The company will not increase its ticket rate of sixteen for \$1.

One-Man Cars in Operation.—The Springfield Street Railway, Springfield, Mass., has put one-man cars on its lines to Indian Orchard and Ludlow. The change became effective Oct. 18. The cars start from Victoria Square instead of from Main and Lyman Streets, as formerly.

Lives Insured.—Employees of the Northern States Power Company, Eau Claire, Wis., who have been with the organization six months or more are to receive the benefits of a group life insurance plan which the company has adopted. The policies will be carried by the Equitable Life Assurance Society, according to an announcement of Vice-President R. F. Pack.

Safety Records Discussed.—Motormen and conductors forming the Terre Haute, Indianapolis & Eastern Traction Company unit of the national safety organization of electric lines met recently in the carhouse of the company at Terre Haute, Ind., to honor the men who had made the best recent safety records. In speaking of the results on the Terre Haute lines J. I. Beals, superintendent, said that from June 1 until Aug. 31, this year, the mileage made by the city cars was 854,400, with an average mileage of 7,600 miles per accident. The total mileage on the interurban lines in the same time was 225,000, with an average of 16,000 miles an accident. In September the main line in Terre Haute won by having only five accidents to the 60,000 miles covered; the southeast bus had only one accident in covering 21,500 miles and the Sullivan interurban division had only two accidents in its 28,400 miles.

More About New Cars.—On blotters 6 x 2½ in. the Indiana Service Corporation, Fort Wayne, Ind., has told the story of its "Wabash Valley Flyers" and "Hoosierlands." A picture shows the luxurious cars which leave Fort Wayne daily and make connections at Peru and Lafayette. Patronage is sought on the de luxe cars which operate via Bluffton, Muncie and Anderson. This descriptive blotter is supplemented by an illustrated folder which gives in detail the schedule of these cars, including the parlor-buffet schedule. The new equipment includes five passenger motor cars and two parlor buffet cars built by the St. Louis Car Company at a cost of \$35,000 each.

Changes Station Names as Co-operative Measure.—At the suggestion of residents of neighboring communities the Chicago, North Shore & Milwaukee Railroad, Highwood, Ill., has changed the names of two of its new stations on the Skokie Valley route. The stations affected and originally named in the \$1,000 prize contest of the North Shore Line early this year are the Skokie Manor station, which is now known as Deerpath, and the Wau-bun station, which is changed to Northfield. Deerpath station is located on Deerpath Avenue, just west of Lake Forest, Ill. Northfield station is situated at Willow Road, adjoining the city of Winnetka, in Northfield township. The new names are considered better suited to the convenience of the traveling public.

More Light in Georgia "Snap Shots."—With the October issue, *Snap Shots*, the official paper of the Georgia Railway & Power Company, Atlanta, Ga., makes its debut as a twelve-page edition. It is expanding from eight to twelve pages in order to publish news concerning the members of the many companies associated in the Georgia group of the Southeastern Power & Light Company. Heretofore *Snap Shots* has been devoted exclusively to the activities of the Georgia Railway & Power Company. Other properties included in this group are the Central Georgia Power Company, Athens Railway & Electric Company, Georgia Southern Power, Rome Railway & Light Company and the Mutual Light & Water Company. The co-operation of all employees is asked for the November issue of *Snap Shots*.

Foreign News

London Railway Men Return

During the last few weeks a delegation of four officers of the Underground Electric Railways, London, England, has been visiting this country to study the latest developments in electric railway and bus practice. In sending over a delegation this year the London company is repeating a practice which it has followed for several years past, though omitted last year. Each year a different group of officers takes the trip, timed so that they can attend the annual convention of the American Electric Railway Association, of which the London company is a member. Those in the party this year were A. V. Mason, deputy general manager; E. T. Brook, superintendent of rolling stock, and J. B. Mackinnon, superintendent of schedules, all of the London Underground, London, and G. Rushton, production engineer London General Omnibus Company, an allied company.

During the trip the party visited Buffalo, Cleveland, Toronto, Detroit, Chicago, Pittsburgh, Washington, Philadelphia, Newark, Boston and New York. The members returned to England on Oct. 30. While in this country they made their headquarters in the office of B. A. Hegeman, Jr., of the National Railway Appliance Company, New York. Mr. Hegeman is representative in this country of the interests of the Underground Electric Railways. On the eve of their departure Mr. Hegeman honored the visitors with a farewell dinner at the Lotos Club, at which a number of prominent electrical railway men in New York were present.

New Electric Line in Spain Completed

A new electric railroad 23 miles in length, known as the Urola, has recently been completed between Zumarraga and Zumaya. The necessary power is supplied in the form of 30,000-volt, three-phase alternating current from the power station of the Sociedad Hidro-electrica Iberica and is converted to 1,500 volts of continuous current at Azpeitia by means of two sets of transformers and mercury rectifiers. The rolling stock consists of seven motor freight cars. Each vehicle is provided with four 75-hp. motors at 1,500 volts for traction purposes. A converter is installed on each vehicle to enable the controller, the brakes and the lighting to be operated at 110 volts.

British Pre-War Halfpenny Fares Not to Be Reinstated.—Restoration of the halfpenny fares in effect in London before the war on short routes of the tramway lines has been abandoned. It was estimated, after consideration by the highways committee of the London County Council, that their reinstatement at this time would result in a yearly loss of about £420,000, unless the passengers increased 10 per cent at the same time.

Recent Bus Developments

Another Jitney Respite

Local Court Acts in Operators' Behalf,
but Ruling by Supreme Court
Is Expected Soon

Operators who have been running their jitneys unmolested in the city of Detroit since an injunction ended the harassing steps taken by the Police Department and other city officials have received a further respite from the State Supreme Court. That body has upheld an order issued by Justice John E. Bird in July last enjoining the city from enforcing the jitney ordinance pending a decision by the United States Supreme Court on the merits of the case. The writ of error was obtained by the Red Star Motor Drivers' Association last summer while the majority of the members of the State Supreme Court bench were on vacation.

VACATION ORDER IN CASE OF DELAY

According to the decision, the right is reserved to the defendant in the case, the city of Detroit, to apply for the vacation of the order in question if there is unusual delay in presenting the case to the United States Supreme Court. It is expected that the case will be disposed of in a few months.

Offensives by the city will include filing a motion with the U. S. Supreme Court to advance on the calendar the hearing on the writ of error issued by Justice McReynolds and petitioning the State Supreme Court to fix a bond of from \$250,000 to \$500,000 on the jitney associations. It is claimed that the D.S.R. has estimated its losses at an amount such that if a decision by the U. S. Supreme Court is not returned until March, five months hence, the bond should be \$500,000.

The corporation counsel's office cited that the State Supreme Court in upholding the injunction against the jitney ordinance quoted an opinion from Chief Justice Taft in which it was ruled that a stay of proceedings should be granted in such cases. It is contended that if court had gone still farther in the same decision it would have seen that Justice Taft stated that when such a stay was granted a bond should issue.

Certain points in the case are reviewed briefly in the court decision. On Dec. 29, 1923, a decree was entered in the Circuit Court restraining the city and certain of its officers from enforcing the so-called jitney ordinance. The defendants appealed to the State Supreme Court and the case was argued on Jan. 6, 1926. On April 14 following the Supreme Court reversed the decree and sustained the validity of the ordinance. This decision was not unanimous. On July 1 a motion for a rehearing was denied. On July 24 a writ was issued by the Supreme Court of the United States and the requisite bond was approved and filed, the writ having been allowed by Justice McReynolds. To this writ return was made Aug. 12.

On July 26 a petition for a stay of proceedings was filed in the Supreme

Court of the state and this court, being on vacation, the chief justice granted the prayer of the petitioners. The city then asked the court to vacate such order.

It is further stated that it will not be necessary to pass on the contention that the order made by the chief justice alone is void, because if it is a nullity, as contended by the corporation counsel, the application of the plaintiffs for a stay of the court's decree is before the court now in session and should be disposed of.

The bill filed in this case is classed as an injunction bill pure and simple. The decision states that should the plaintiffs' contention be sustained in the United States Supreme Court, irreparable injury would be suffered by the failure to stay the decree of the State Supreme Court.

It is further cited that the allowance of the writ by Justice McReynolds is *prima facie* evidence that a meritorious federal question is involved. The State Supreme Court does not overlook the defendants' claim that the writ was allowed upon the injection of issues not urged in the trial court or the State Supreme Court. Whether such issues were injected and whether the Supreme Court of the United States will consider such issues are questions for that court to determine, not for the State Supreme Court.

New Waiting Station for Milwaukee Erected

A new type of waiting station which will afford greater convenience and comfort to street car and bus passengers of the Milwaukee Electric Railway & Light Company has been erected at the intersection of North and Lisbon Avenues at 47th Street, Milwaukee. This shelter, the first of its kind in Milwaukee, consists of a glass-enclosed structure, triangular in shape, placed on a raised concrete platform which forms a safety island in the center of the intersection. The roof is covered with red Spanish tile and has ornamental copper crusting. The interior is lighted at night.



An Escape from the Elements Afforded Milwaukee Passengers

Commission Permits Buses on Any Nashua Street

An order made by the Public Service Commission of New Hampshire on Oct. 28 on application of the Nashua Street Railway and the associated Nashua Transportation Company is probably the broadest and most liberal ever issued to an electric railway operating buses.

The commission specifies that service outside the city of Nashua is to be conducted over certain routes in the name of the Nashua Transportation Company, but the order grants to the Nashua Street Railway the right to run buses over any street within Nashua at its own discretion. The only stipulations are that schedules of routes must be filed with the Public Service Commission and that residents of Nashua shall have the right to appeal to the commission in cases where requests for service in certain sections are not granted by the company.

It is the opinion of the commissioners that, under ordinary circumstances, a company starting bus service in a city should be permitted to decide for itself what streets may best be included in convenient and profitable routes.

Municipal Buses in Buffalo Quit

Operation of the two municipal bus lines established last July by Mayor Frank X. Schwab of Buffalo, N. Y., was suspended on Oct. 30 owing to the serious illness of the Mayor. Orders to discontinue the lines were issued by John L. Kelly, the Mayor's secretary. The four other members of the City Council have no knowledge of the contracts between the Mayor and the companies which supplied the service. Recently when the Mayor refused to reveal details of the municipal bus service and its costs the Council rejected the Mayor's proposal to enter into agreements with several other companies to operate additional lines. It was said that it may be a month or more before the Mayor is able to return to his office. The South Buffalo-Main Street line used buses under an agreement with the manufacturer of the buses while the Delaware Avenue-Richmond-North Park route used buses under a lease arrangement with John C. Montana, who operated the Buffalo-Niagara Falls route last summer.

Massachusetts Commission Frowns on Double-Deck Vehicle

The Public Utilities Commission of Massachusetts, after carefully considering the operation of double-deck buses by the Boston Elevated Railway, has prohibited their use. The elevated has been operating a double-deck bus from the Fenway to Bowdoin Square on a temporary certificate. In its finding the commission states the bus is longer than the Legislature proposes to permit. Moreover, the commission found there was not suitable means of exit, but the elevated agreed to provide an emergency door. With this in use the commission found that passengers leaving the upper deck would be checked by the use of these emergency doors and voted them of little or no use as a means of safety.

The finding, in part, reads:

Buses do catch fire, and we know that buses do capsize. Instances have occurred in this state within a year where buses have caught fire, in one of which serious loss of life resulted.

Instances have also occurred where there have been accidents in which a bus has been overturned. We hesitate, therefore, notwithstanding the means adopted to insure the safety of the passengers, to approve the operation of such a vehicle unless there are reasons for its operation which outweigh possibilities of danger to the passengers.

It has been urged that this type of bus is in successful operation in New York, Philadelphia, Cleveland and other cities. Time may demonstrate that our apprehensions in relation to their safety are not justified. If such should be the case, and it becomes clear that it is not the intent of the Legislature that motor vehicles operating regularly upon the highways are to be limited to 28 ft. in length, application for authority to operate such vehicles may be renewed.

Reading Railroad Modifies Its Plan

After the Reading Company, Philadelphia, amended its application of Oct. 29 to operate buses between Doylestown and Norristown and asked permission to run the buses between Doylestown and Lansdale, a distance of 10 miles, the Philadelphia Rapid Transit Company and the Lehigh Valley Transit Company withdrew their opposition. Thereupon, the application was granted. E. D. Osterhout, passenger traffic manager, said that passenger trains were being operated on the Doylestown branch of the system at a loss. The company desired to economize by withdrawing some of the trains and substituting buses.

Suggests I.C.C. as Appeal Court in Interstate Cases

Following the conclusion of hearings held from coast to coast by the Interstate Commerce Commission since the June adjournment of Congress to consider the matter of bus and truck regulation, the commission has given parties at interest until Nov. 15 in which to file briefs. This means that conclusions of the commission as to the necessity of federal control and the character of such control will not be submitted until after the Christmas holidays.

The annual report of the commission carrying the recommendation to be made to Congress for railroad legislation has been prepared and will be sent

to the printer before the briefs are filed in the bus case.

Efforts to vest complete jurisdiction over highway traffic in the commission have been practically abandoned. Considerable support has centered, however, around the proposal of the Bus Division of the American Automobile Association for an innovation in regulation of interstate commerce by the States through their regulatory commissions. Proponents of the plan claim that it is constitutional and will solve the difficulties arising from lack of any form of regulation of interstate traffic.

The Bus Division proposes that in application of the law the Interstate Commerce Commission would retain final authority and that it would constitute an appeal court in cases brought up from the state commissions.

Intervention of I.C.C. Sought in Pennsylvania Case

Counsel for the Schuylkill Railway and the Schuylkill Transportation Company, Girardville, Pa., has filed an appeal to the Interstate Commerce Commission at Washington, D. C., to prohibit the Reading Company, a steam carrier, from operating bus service in Pennsylvania, except under regulations by the commission.

The appeal is said to be based, among other things, upon a decision of the United States Supreme Court. As recently as last May Justice Brandeis is quoted as having stated:

A steam line operating in both interstate and intrastate commerce cannot engage in losing local (intrastate) business "not required for public necessity and convenience," and thus create "prejudice to interstate commerce" derived from profitable high rate interstate passenger and freight business.

Numerous applications for the right to operate buses have been filed by the Reading Company at Harrisburg for approval of the Public Service Commission. Governor Pinchot recently refused to grant a charter for the Reading subsidiary, under which the company proposed to establish bus service in 24 counties of the state, including territory served by the two Schuylkill companies with both railway and bus for a number of years.

South Shore Bus Establishes Commutation Rates

Further deployment of modern merchandising methods in the co-ordinated transportation business is instanced in the recent announcement by the management of the Shore Line Motor Coach Company, joint subsidiary of the Chicago, South Shore & South Bend Railroad and Gary Railways, that bus rates would be reduced nearly 40 per cent in favor of the frequent rider between Gary, Ind., and downtown Chicago.

A new ten-ride bearer commutation ticket rate of \$5.50, and proportionately lower rates from intermediate points, was established by the company on Oct. 22 between these two cities. The tickets are transferable and are good for six months from date of sale. The former rate of \$1.70 for a round trip and 90 cents one way will continue to apply, however, on all single and round trip tickets to the Chicago "Loop."

The commutation tickets are for use between Gary and Chicago on the Shore Line Motor Coach Company's fleet of new 29-passenger Fageol Safety coaches operating from Grand Rapids, Benton Harbor, Michigan City, and Gary to Chicago. The rates are almost identical with the commutation fares established on Sept. 16 by the Chicago, South Shore & South Bend Railroad, which closely parallels the coach route, between Chicago and Gary.

Bus Changes in Cincinnati.—The Oakley bus line of the Cincinnati Motor Bus Company has been taken over by the Cincinnati Street Railway, Cincinnati, Ohio, while the Norwood line of the same company will be operated by the City Transit Company. Approval of the recent application for the sale of these lines was announced recently by E. D. Gilman, Director of Public Utilities. The Cincinnati Street Railway has also taken over the operation of the Coney Island line of the Cincinnati Motor Bus Company, which will continue to operate only its Erie Avenue-Madisonville line.

End of Summer in Ottawa.—The Ottawa Electric Railway, Ottawa, Canada, recently discontinued its regular sight-seeing motor coach trips. No further regular trips will be operated until next spring. The company will, however, supply chartered motor coach service.

Bus Line Extended.—A certificate has been granted by the California Railroad Commission to the Key System Transit Company to operate a California bus service between a point at the intersection of High Street and East Fourteenth Street in the city of Oakland, and a point at the intersection of Ygnacio Avenue and High Street, and intermediate points. This means virtually an extension of its Fernside bus line. The Key System has also been authorized by the Railroad Commission to operate a bus service as an extension of its Thousand Oaks Street car line in the city of Berkeley, Cal. This route will serve a section of the East Bay which is growing rapidly and has had inadequate transportation.

Bus as Transport Factor Grows in Significance.—The title of Electric Railway Section of the Wisconsin Utilities Association has been changed to Transportation Section as it carries a wider and fuller description of the functions of the section.

Company Operates on Temporary Permit.—The Scranton Railway, Scranton, Pa., has secured temporary permits from the Public Service Commission to discontinue operation of its railway from Wilson Creek to Forest City, and to operate buses between Forest City and Carbondale. There was a hearing on the permanent abandonment and application for the operation of buses in Scranton on Oct. 21. The commission has reserved decision.

Would Extend Bus Service.—The Milwaukee Electric Railway & Light Company, Milwaukee, Wis., has applied to the city for permission to install auxiliary bus service on the south side. This line would extend from National Avenue and Twenty-second Avenue south to Forest Home Avenue.

Financial and Corporate

Improvement on Third Avenue

\$37,893 Net Income Compared with \$102,138 Loss a Year Ago—Place of Bus Defined

For the fiscal year ended June 30, 1926, the operating revenue of the Third Avenue Railway System, New York, N. Y., was \$14,666,998, an increase of \$124,489 over the fiscal year ended June 30, 1925. The operating expense was \$11,102,520, or a decrease of \$64,332 over 1925. These facts were disclosed in the annual report to the stockholders of the company.

STATEMENT OF INCOME OF THE THIRD AVENUE RAILWAY SYSTEM FOR YEARS ENDED JUNE 30, 1926 AND 1925

	1926	1925
Operating Revenue:		
Transportation.....	\$14,222,084	\$14,111,026
Advertising.....	150,000	150,000
Rent of tracks and terminals.....	24,399	25,668
Rent of buildings and other property.....	208,102	189,147
Rent of equipment.....	50,152	50,980
Sale of power.....	12,259	15,686
Total operating revenue	\$14,666,998	\$14,542,509
Operating Expenses:		
Maintenance of way and structures.....	\$2,256,726	\$2,408,682
Maintenance of equipment.....	1,699,862	1,770,359
Depreciation accruals.....	989,753	660,936
Power supply.....	917,503	981,156
Operation of cars.....	4,872,190	4,985,676
Injuries to persons and property—expended.....	1,174,784	1,056,056
Injuries to persons and property—reserved.....	31,903	9,096
General and miscellaneous expenses.....	613,108	617,952
Total operating expenses	\$11,102,519	\$11,166,851
Net operating revenue	\$3,564,478	\$3,375,657
Taxes.....	1,036,624	1,044,377
Operating income	\$2,527,854	\$2,331,279
Interest revenue.....	197,434	252,532
Gross income	\$2,725,288	\$2,583,811
Deductions from gross income:		
Interest on first mortgage bonds.....	\$513,080	\$541,607
Interest on first refunding mortgage bonds.....	879,620	879,620
Interest on adjustment mortgage bonds.....	1,126,800	1,126,800
Track and terminal privileges.....	18,942	18,418
Miscellaneous rent deductions.....	8,499	8,293
Amortization of debt discount and expense.....	22,451	22,451
Amortization of limited franchises.....	7,469	8,581
Sinking fund accruals.....	33,480	33,480
Bus operation.....	16,783	
Miscellaneous.....	60,268	46,697
Total deductions	\$2,687,395	\$2,685,950
Net income	\$37,893	\$102,138

Italic denote deficit.

S. W. Huff, president of the company, called the attention of stockholders to the results of expenditures for equipment, which had been mentioned in the report of the year previous, as necessary for the company to make in order to stop the downward tendency in receipts. These expenditures had resulted in increased receipts and decreased operating expenses, with a substantial

improvement in the financial condition of the company.

It was his belief that in view of the uncertainties that confront the local surface railways, it was important that the companies of the system be prepared, through a strong cash position, either to buy buses for the purpose of engaging in such transportation in a large way or to contend with a certain degree of bus competition. He said that where the company could consistently do so, it had applied for franchises for bus operation which would co-ordinate with trolley lines and serve as feeders rather than as competitors. By such co-ordination the public would receive the best possible service at the lowest cost, and the investment in existing facilities would be protected.

REVIEW OF FINANCIAL AFFAIRS

President Huff went into detail on the financial status of the company for many years past. He said that there had been a large growth in revenue, but little territorial expansion of the system. This was remarkable when it was considered that a large part of the system served territory in Manhattan which for a generation had been fully developed by a type of building most desirable for supplying travel for surface transportation, and that so large a part of the operation in Manhattan had become congested with street traffic as to make it very difficult to operate cars in the streets with any degree of speed and regularity.

He said "the steady increase in revenue of the Third Avenue Railway System has been due to the vision of its early directors in determining not to confine its operations to Manhattan alone, but to extend the operations of the system into the then undeveloped territory north of the Harlem River." This seemed a perilous venture at that time, but the territory had grown rapidly until now it furnished more than half of the total revenue of the system, and all of its increase in revenue. During the past fiscal year there was a loss of \$130,810 in operating revenue in the territory south of the Harlem River with an increase of \$255,299 north of the Harlem River.

WESTCHESTER SITUATION IMPORTANT

The situation in White Plains and Westchester vicinities was reviewed in the report. According to the report the Third Avenue Railway's position at the county seat of Westchester County is an important move for the system and only another step in the path of the policy of progressive but conservative development of adjacent territory. This extension, according to the report, into adjacent territory should protect not only the territory already served, but should mean much for the future prosperity of the company's system.

The system, in addition to all the trolley lines in the Bronx, includes all of the lines in the southern portion of Westchester.

Another Step in St. Louis Reorganization

The committee representing holders of bonds of the St. Louis & Suburban Railway, St. Louis, Mo., on Oct. 26 filed an amended bill of complaint in the United States District Court in St. Louis, Mo., preparatory to formal foreclosure of its mortgage on the properties now a part of the United Railways. The filing of this amended petition is another step toward the final reorganization of the United Railways.

The amended bill asks that the court direct the United Railways to pay all money due under the Suburban mortgages and in default of such payment to ascertain the exact properties covered by such mortgages, that the mortgages be declared a first lien and that the properties covered by them be sold for payment of the bondholders. It is anticipated that hearings will be held on the application before a special master to determine the extent and value of the Suburban properties.

Traffic, Wage and Fare Figures

Electric railway passenger traffic recovered from the slight slump reported for the month of August. During the month of September there was an increase in traffic, thus continuing the record of traffic increase which has been maintained throughout the whole of 1926, with the exception of the month of August.

The number of revenue passengers, including bus passengers, reported to the American Electric Railway Association by 207 companies for the month of September, 1926, compared with the similar month of last year, is as follows:

September, 1926	755,574,986
September, 1925	748,340,801
Increase, per cent	0.97

Average cash fares in cities of 25,000 population and over:

	Cents
Oct. 1, 1926	7.7056
Sept. 1, 1926	7.7056
Oct. 1, 1925	7.5996

Average maximum hourly rates paid motormen and conductors in two-man service by companies operating 100 miles or more of single track:

	Average Hourly Rate, Cents	Index Number 1913 = 100%
Oct. 1, 1926	56.88	208.73
Sept. 1, 1926	56.87	208.70
Oct. 1, 1925	56.25	206.42

Trustee Bids in Pennsylvania Line

Track, overhead and other similar property of the Philadelphia & Easton Transit Company, Easton, Pa., was recently sold at public auction for \$51,000. The line, 32 miles long, was built at a cost of more than \$1,000,000. It was considered the most picturesque road of its kind in eastern Pennsylvania. It has been in constant operation since Sept. 13, 1904. The purchaser was Augustus H. Sickler, Philadelphia, acting for the bondholders. The real estate and other property of the company will be disposed of at private sale. A bus line will be operated between Doylestown and Easton.

Public Service to Take North Jersey Rapid Transit

Application for the approval of the sale of the property of the North Jersey Rapid Transit Company has been made to the Public Utilities Commission by Henry H. Parmelee, receiver of the railway. The sale price of \$200,000 has been approved by the Court of Chancery. The company operates cars between East Paterson and Suffern. It went into the hands of a receiver in 1912 on application by the Hamilton Trust Company, Paterson, trustee under a mortgage made in 1910 to secure an issue of \$800,000 of bonds. The sale of the road to the Public Service Railway has been approved by the bondholders and by the trustee.

Refunding Operation Planned in Worcester

The Worcester Consolidated Street Railway, Worcester, Mass., has up for discussion several important problems in connection with the rehabilitation program. The directors have asked the stockholders for authority to abandon unprofitable lines, to sell any of the track, overhead work and other equipment of these lines.

The stockholders will also be asked for a decision regarding the creating of a single blanket mortgage under which bonds could be issued to take up securities now outstanding. The mortgages referred to are listed as follows: A \$1,200,000 mortgage of the Worcester Consolidated Street Railway, dated Nov. 1, 1907; a \$500,000 mortgage of the Worcester & Southbridge Street Railway, dated Sept. 1, 1902; a \$40,000 mortgage of the Uxbridge & Blackstone Street Railway, dated Oct. 1, 1907.

It is unlikely that any definite move will be made now on the first of these proposals, but the directors, in seeking authority to act, merely wish to be vested with the authority to deal with any lines that continue unprofitable without calling a special meeting of the stockholders on each occasion.

Story of Their Company Told to New Jersey Stockholders

"Public Service Review—1926," a 72-page book in two colors, which explains by text and by pictures some of the many uses of the utility services furnished by the subsidiary companies of Public Service Corporation of New Jersey, is being sent to the corporation's stockholders.

This is the fourth in the series of "Reviews." The first, in 1923, outlined the historical development of Public Service, the book for 1924 told of the physical properties necessary to furnish gas, electric and transit service to most of the people of New Jersey and the book for 1925 was a record of construction and extension projects undertaken by Public Service.

The present volume tells of the manifold applications of electrical energy, the increasing use of gas as an industrial fuel and the basic service performed by local transportation in community development.

The book also presents the con-

solidated balance sheet of the corporation and its subsidiary companies and other statistical tables showing the operations of Public Service companies.

Issue of Notes Approved.—Issuance of \$105,000 of equipment notes by the Central Transportation Company, Trenton, N. J., a subsidiary of the Trenton & Mercer County Traction Company, has been approved by the New Jersey Board of Public Utilities Commissioners. The proceeds are to be used in the purchase of buses.

Operation Statement Shows Improvement.—For the nine months period ended Sept. 30, 1926, the operating revenue of the International Railway, Buffalo, N. Y., was \$8,095,985, against \$7,980,166 in 1925. Operating expenses and taxes decreased from \$6,950,729 to \$6,843,938 for the nine months period of the current year. After the consideration of income deductions there remained a net income of \$194,611 for the nine months of 1926, against a deficit of \$92,271 a year ago.

Bond Issue Authorized.—The Indiana Public Service Commission has authorized the Evansville & Ohio Valley Railway, Evansville, Ind., to issue \$56,500 in first refunding 5 per cent bonds to be sold at not less than 87½ per cent of par. Vice-President Millican said the money would be used for general improvements.

Surplus Lower.—For the period from Jan. 1 to Aug. 31, 1926, the gross earnings of the Lake Shore Electric Railway Company, Cleveland, Ohio, were \$2,152,788, against \$2,128,788 for the 1925 period. Operating expenses and taxes increased from \$1,735,551 to \$1,856,273. After the consideration of interest, there was a surplus in 1926 of \$5,888, against a surplus for the period from Jan. 1 to Aug. 31, 1925, of \$102,582.

Bond Payment Affects Terminal Ordinance.—Further delay in consideration of the application of the Pacific Northwest Traction Company for enactment of a franchise ordinance to permit construction of a new terminal on Stewart Street, Seattle, Wash., is the result of the refusal of A. W. Leonard, president of the Puget Sound Power & Light Company, to reduce payments on the railway purchase bonds or to accept bonds in payment of the city's share of the 1919 railway tax. The City Council utilities committee has asked these two concessions in return for enacting the franchise ordinance. Mr. Leonard offered to accept the amount in five equal payments.

Encouraging Report in Buffalo.—The International Railway, Buffalo, N. Y., in the nine months ended Sept. 30, 1926, earned a net income of \$194,611 after all operating expenses, taxes and deductions, compared with a deficit of \$92,271 in the corresponding period of last year. Operating income was \$115,819 greater than in the nine months period last year and operating expenses were \$106,791 lower than a year ago. Increased use of one-man cars and greater co-operation on the part of employees are said by the company to be largely responsible for this favorable showing.

Loss in Tacoma.—Figures showing that the Tacoma Railway & Power Company, Tacoma, Wash., has lost more than \$500 a day on an average during the month of September are given in a recent combined statistical report to the City Council by the Tacoma Railway & Power Company and the Pacific Traction Company. The figures show that September's loss was \$15,881 and that the loss has been \$42,127 for the three months since cash fares have been 8 cents and tokens fifteen for \$1.

Hears Abandonment Petition.—The Public Service Commission on Oct. 26 held a hearing on the petition of the Hudson Valley Railway, Glens Falls, N. Y., for approval of a declaration of abandonment of two portions of its line, Route 1, known as the Lake George-Warrensburg line, and Route 2, known as the Thomson-Greenwich line. Opposition was offered to the abandonment of the Thomson-Greenwich line, particularly by the Stevens & Thompson Paper Company and other paper manufacturing plants, on the ground that great inconvenience would be caused the residents of this territory if service were discontinued. There were no appearances noted from the village of Warrensburg. Testimony was offered by the railway to show that losses were increasing from year to year. The hearing was adjourned to Nov. 11, 1926, at the office of the commission in Albany.

Combined Revenues Show Gain.—While passenger revenues collected during September by the Madison Railways, Madison, Wis., showed a loss of \$752 over the corresponding month in 1925, the combined railway and bus revenues, however, show a gain of \$886 over September, 1925. Gross car and bus revenues for September were \$31,011, compared with \$30,125 for September of last year. Combined railway and bus revenues still continue, however, to fall below the four-year average of 1920-24. There were 452,670 railway and bus passengers in September, compared with 438,482 for the similar month last year, an increase of 14,188. Of this number, 410,792 were carried by the railway. This is 82,695 fewer passengers than the four-year average.

Deficit Increases.—For the two months ended Aug. 31, 1926, the total revenue from all sources of the Interborough Rapid Transit Company, New York, N. Y., was \$8,534,419, a decrease of \$1,112,695 over the corresponding period of last year. Expenditure for operating and maintaining the property increased \$516,205. Taxes payable to the city, state and the United States increased \$75,028. Rentals and other income deductions increased \$27,788. The net result for the two months was a deficit of \$2,095,845. This is \$1,731,718 greater than the deficit for the corresponding period of last year. The comparison with last year is influenced by the strike during the month of July of this year, as well as the fact that in July of last year there was a lump sum payment of \$770,000 on account of the new advertising contract, against which no similar payment was made to the company this year.

Legal Notes

FEDERAL DISTRICT COURT.—*Unauthorized Action by City Not Within Federal Jurisdiction.*

The city of East St. Louis adopted an ordinance requiring the removal of certain track from the street, and the railway company took the case to the federal courts under the fourteenth amendment. The district court decided that under the amendment mentioned, if the enactment of the ordinance was within the authority granted to the city by the state, it became a matter of federal jurisdiction, but if the ordinance was not authorized under power granted by the state, such an act is not the act of the state and cannot be enjoined by a federal court. The remedy is by action in a state court. [13 Federal (Second), Rep., 852.]

CALIFORNIA.—*Duties of Motorman and of Automobile Driver to Avoid Collision at Street Intersection.*

While the duties of a motorman and of an automobile driver approaching an intersection are reciprocal, yet from the fact that the street car is confined to its tracks, it is the duty of the automobile driver to give way to its clear passage. When there is failure by an automobile driver to observe the approach of a street car and use ordinary care to avoid a collision therewith, in order that recovery be had, it must be shown that the motorman actually observed the automobile in time to avoid the injury, before the doctrine of the last clear chance applies. [Haber et ux vs. Pacific Electric Railway, 248 Pacific Rep., 741.]

GEORGIA.—*Contributory Negligence in Jumping Toward Street Car to Avoid Injury by Automobile Held Question for Jury.*

Where one who is confronted by a sudden and dangerous situation, or emergency, while signaling a street car to stop at a street corner, a regular stopping place, on account of an automobile approaching directly toward him, or other circumstances likely to impair his judgment or discretion, such person cannot be held as matter of law to be lacking in ordinary care. Whether such person, who, in such emergency, and in order to avoid being struck by the automobile, jumps toward the street car, and is injured thereby, is guilty of contributory negligence so as to defeat an action for damages is a question of fact for the jury to determine. [Bryant vs. Georgia Ry. & Power Co., 134 Southeast. Rep., 319.]

MASSACHUSETTS.—*Improperly Registered Automobile Held to Be a Nuisance, Precluding Recovery by Owner for Personal Injuries.*

A married woman kept her automobile registered under her maiden name, although married two years and living with her husband. It was held that the statute requires a motor vehicle to be registered in the name of its owner and if it is not so legally registered, it is a nuisance on the highway. Hence,

its owner is precluded from recovery in case of accident. [Bacon vs. Boston E.R. Co., 152 Northeast. Rep., 35.]

NEW YORK.—*On Condemnation of Spur, Elevated Railroad Held Entitled to Compensation for Right to Impair Abutting Owners' Easements of Light, Air and Access.*

The city of New York condemned a spur of the Manhattan Railway (elevated) on East 42d Street about two blocks long. In the valuation proceedings, various factors were considered, including the claim of the city that the expense of operation of this spur exceeded its receipts, and that little, if any, traffic was lost because passengers would use a neighboring station, claims of the company for franchise value, easement of light, air and access to abutting property, etc. The courts held that the determination of compensation in condemnation cases is a judicial function and specified \$25,000 for the franchise, \$120,438 for the physical property removed, \$80,000 for additional sums expended to reconstruct a neighboring station because of the removal, and \$750,000 for the easement rights. [In re 42d Street spur of M. R., 216 N. Y. Supp., 34.]

NEW YORK.—*Permit to Operate Buses Without Reservation of Right of Revocation, Granted by an Ordinance, Is a Franchise.*

An ordinance of Oswego, passed May 25, 1925, granted a bus company the right to use certain streets for ten years, but on Jan. 11, 1926, a resolution canceling the permission was passed. The court upheld the position of the bus company, since the grant was one of which it could not be deprived without due process of law and without compensation. [Colonial Motor Coach Corporation vs. City of Oswego, 215 N. Y. Supp., 159.]

NEW YORK.—*Duty of Driver of Stalled Truck on High-Speed Railway.*

Where the driver of a truck stalled at a crossing on the track of a high-speed railway remains in the truck for the purpose of saving it from destruction, though he has an opportunity to save himself, he cannot recover damages, although the same degree of care is not required of a man in an emergency that is otherwise demanded. [Fowler vs. International R. Co., 216 New York Supp., 558.]

NEW YORK.—*Duties of Pedestrian Crossing a Plaza.*

In a plaza, which was not a regular crossing, a street car has paramount right of way. At such a place, a pedestrian should not assume that a slowly moving car will not pick up speed, and he must exercise increased vigilance if his view of an approaching car is obscured by a taxicab. If he saw the car coming, it is immaterial whether the warning gong was rung [Hinz vs. Eighth Avenue Railroad, 213 N. Y. Supp., 362.]

OHIO.—*Rulings of Public Utilities Commission on Bus Certificates Upheld.*

In one decision, the Supreme Court of Ohio passed upon seven different rulings on bus franchises of the Public Utilities Commission. They involved the legality of certain rules of the commission, regarding time for filing applications and protests, power to determine whether certain service is necessary, etc. In all these cases, the rulings of the commission were upheld. [Cincinnati Traction Co. vs. Public Utilities Commission of Ohio, et al. and six other cases, 150 Northeast. Rep., 81.]

OHIO.—*Revocation of Bus Certificates by Commission Held Unauthorized.*

The Public Utilities Commission of Ohio revoked the certificate of a bus operator on the ground that he had failed to operate his route. Actually, he had leased his equipment and the operation of the line to another man, but would receive all receipts less operating expenses and a fixed amount to cover the services of his agent or lessee. This was held not to constitute abandonment. [Small vs. Public Utilities Commission of Ohio, 150 Northeast. Rep., 37.]

TEXAS.—*Company Not Responsible for Intending Passenger Struck by Automobile.*

A city ordinance requires street cars to stop at the near side of crossings to receive and discharge passengers when any wish to board or leave a car. The plaintiff stood at such a corner near the track and signaled to an approaching trolley car to stop, but it did not do so. The passage of the car raised considerable dust, and the intending passenger was struck and injured by an automobile following the trolley car, driven by a person unknown to him. He brought suit against the railway company, alleging the injury would not have occurred if the car had been stopped as required by law. The court held that the failure to stop the car was not the proximate cause of the injury and that while it was the duty of the motorman to stop his car to take on and discharge passengers, it cannot be supposed he would anticipate that should he not do so an automobile might run against and injure a person presenting himself for passage. The protection of persons on the street from passing automobiles was not the purpose of the passage of the ordinance. Hence the company was not responsible. [Franklin vs. Houston Electric Co., 286 Southwest. Rep., 578.]

VIRGINIA.—*Authority to Abandon Line—Paving Obligations on Abandoned Line.*

The State Corporation Commission has power to permit a discontinuance of street railway operation on particular lines where continued operation would result in confiscation. It is not obliged to order a valuation on all the railway properties to determine whether these particular lines have been operated at a loss. The question of the company's paving obligations on lines so abandoned is a moot question. [City of Hampton vs. N. N. & H. R.G. & E. Co. (two cases), 131 Southeast. Rep., 328-330.]

Personal Items

C. J. Golden, Mine Union Official, on Pennsylvania Commission

The last vacancy in the Public Service Commission of Pennsylvania was filled on Oct. 29, with the appointment by Governor Pinchot of Chris J. Golden, Shamokin, president of District No. 9, United Mine Workers of America. Mr. Golden will fill the unexpired term of J. Henry Scattergood, which terminates July 1, 1929.

Mr. Golden has been a leading figure among the union miners of the anthracite regions for several years. He is also chairman of the Tri-District Board and the Anthracite Scale Committee. He played an important part in the conference between the operators and miners in the negotiations over wage and other disputes. Mr. Golden is also a member of the Anthracite Conciliation Board and of the International Scale Committee. His eight years membership on the Anthracite Negotiating Committee was cited by Governor Pinchot as evidence of Mr. Golden's fitness for the office.

The Governor has also recently named Richard J. Beamish for appointment to the commission. Mr. Beamish is a journalist now serving on the staff of the Philadelphia *Inquirer*.

Joseph G. Forsthove, district manager of the Illinois Power & Light Corporation at Quincy, Ill., has resigned to become manager of the Kewanee Public Service Company and the Kewanee & Galva Railway, Kewanee, Ill.

W. C. Bartels, recently made traffic engineer of the Wisconsin Power & Light Company, has been placed in charge of the newly created traffic department at Fond du Lac, Wis. The purpose of the new traffic department is to build up both bus and railway business, publish schedules and handle advertising.

R. D. Morrison, formerly superintendent of the Wichita Railroad & Light Company, Wichita, Kan., has succeeded Joseph G. Forsthove as manager of the Quincy division of the Illinois Power & Light Corporation. For the past ten months Mr. Morrison has been in charge of the railway properties at Venice, Ill.

Harry P. Chandler has been appointed an executive assistant of the Public Service Corporation, Newark, N. J. He has been in the employ of the company and its predecessors for 36 years, and for the last seventeen years has been division agent of the central division for the electric and gas departments.

Charles A. Brann has been appointed superintendent of railways for the Eastern Texas Electric Company, Beaumont, Tex. In this capacity he succeeds Ralph A. Gill. Mr. Brann was formally superintendent of traffic for the Houston Electric Company and early this year was made superintendent and pas-

senger agent of the Galveston-Houston Electric Company. He has also been identified with the El Paso Electric Company, El Paso, Tex.

New Duties Assumed by North Shore Officials

Appointment of John F. Egolf as general manager and Howard P. Savage as assistant general manager of the Chicago, North Shore & Milwaukee



J. F. Egolf

Railroad, Highwood, Ill., was made Oct. 25 in an official announcement by the North Shore Line. This follows the recent appointment of Jesse S. Hyatt, former general manager, as chief engineering assistant to Bernard J. Fallon, vice-president in charge of operation of the four electrically operated railroads in the Metropolitan area, and of Bert W. Arnold, former assistant general manager, to have supervision of motor coach operations of the railroads. These changes were referred to briefly in the *ELECTRIC RAILWAY JOURNAL*, issue of Oct. 30, 1926,



H. P. Savage

page 829. Mr. Egolf's career has been reviewed previously in these pages.

The new assistant general manager is an internationally known figure, having only a few days ago been elected national commander of the American Legion at the national convention in Philadelphia. He has been serving the Chicago Rapid Transit Company as general superintendent of maintenance of way. Mr. Savage entered the electric railway industry in 1913 as a track foreman on the Metropolitan West Side Elevated Railroad. Later he was promoted to track engineer of the "L" lines and then to the position which he held at the time of his new appointment. During the World War he secured a leave of absence and obtained a commission in the 55th Engineers, serving in France from July, 1918, until July, 1919. On his return to civil life he resumed his position with the Rapid Transit Lines, in accordance with the policy of all utilities under the management of Samuel Insull and associates, that every one who was in government service should be restored to his former position or a better one.

Greater Individual Responsibility Under New Pittsburgh Plan

A new form of supervision, whereby the entire structure of the operating department of the Pittsburgh Railways, Pittsburgh, Pa., will be solidified and systematized, has been approved and will begin to function within a few days. The plan is based upon a policy of making each executive assume entire responsibility for his own departmental activities.

The scheme generally reaches to the fundamentals of railway operations. In the new plan J. M. Loftis, veteran superintendent of transportation, will delegate to three superintendents under him the three distinct functions of car operation.

A. J. Fink, formerly assistant to the general manager, has been made superintendent of traffic and schedules.

Frank W. McCarthy, formerly assistant superintendent of transportation, has been named superintendent of car operation.

Another man, so far unchosen, will be made superintendent of trainmen's instruction.

All of these functions, in the transportation scheme, have so far been handled by Superintendent Loftis. The duties will now be definitely divided, as they represent three distinct units of operation.

The trainmen's instruction department will prepare the men and school them before and after they go on the cars, so that they will be equipped to handle cars safely and adequately, and at the same time recognize the value of salesmanship and courtesy.

Mr. McCarthy's department includes the actual operation of the cars and the supervision of the men at the carhouses.

Mr. Fink's department will keep the cars moving and see that the service is carried through. He will have to assist him a traffic engineer; a chief inspector, R. C. Rearick, formerly load dispatcher, and four district inspectors,

F. A. McCarthy, William Fitzgibbons, Michael J. Carter and Earl Siggins, who were formerly inspectors but will henceforth be in charge of the inspectors of their respective districts.

Simultaneously with the reorganization of the transportation department, the mechanical departments of the company have been simplified and coordinated on a similar plan.

A. H. Leschke, formerly maintenance engineer, has been made operating engineer and will serve both transportation and maintenance departments.

Richard S. Bull, formerly shops superintendent, has been made superintendent of equipment, in charge of both the carhouse and shop departments.

Oscar Williams, formerly head of the way department, has been named superintendent of the way and structures, in charge of all track, rights-of-way, buildings and other structures.

M. W. Cooke, formerly chief of current control, is now also in charge of inclines, with the title of superintendent of power and inclines.

The plan will provide a closer supervision, with one man definitely at the head of each specialized branch of the railway's operation. Hitherto in the transportation department enlarged duties were handled through the appointment of an assistant. The new method groups all of the duties of the department and allocates them to one of the three new positions.

P. L. Smith is now treasurer of the North American Light & Power Company, Chicago, Ill. He has been affiliated with this company since 1916, when he assumed duties in the financial and accounting department. For three years he served as assistant secretary and assistant treasurer of all the companies in the North American Light & Power group.

Dr. Trumbower, chairman of the committee of highway finance of the highway research board, has resigned his position with the United States Bureau of Public Roads to become professor of transportation at the University of Wisconsin. One of his duties will be the development of a highway transport curriculum. He will continue his highway research activities.

Hal M. Lytle, vice-president of the Chicago, North Shore & Milwaukee Railroad, of the Chicago Rapid Transit Company and of the Chicago, Aurora & Elgin Railroad, was recently elected to a similar office by the directors of the Chicago, South Shore & South Bend Railroad and the Shore Line Motor Coach Company. The South Shore Line is a high-speed electrically operated railroad between Chicago and South Bend. The motor coach company is owned by the South Shore Line and the Gary Railways, in equal portions, and serves many of the cities served by the South Shore Line, as well as acting as a feeder for that railroad. The South Shore Line and Gary Railways are subsidiaries of the Midland Utilities Company.

W. D. Allen, general manager of the Hamburg Railway, Hamburg, N. Y., has assumed general management of the company's new suburban bus line operating between Buffalo and Hamburg.

L. S. Ready Will Succeed C. O. G. Miller on Key System

C. O. G. Miller will resign as president of the Key System Transit Company, Oakland, Cal., on Jan. 1 and he succeeded by Lester S. Ready, chief engineer of the California Railroad Commission. The board of directors will meet on Nov. 12, at which time formal action will be taken on these changes.

It is announced that Mr. Miller is slated to stay as chairman of the board of directors.

Mr. Ready has been a railroad commission engineer for thirteen years, or since his graduation from the University of California. He has been chief engineer for 3½ years. He was an honor student at the university and is one of the most successful engineers on the Pacific Coast.

Mr. Miller has been president of the Key System since its organization. He issued a formal statement announcing his retirement from the presidency and asking the public to support and co-operate with his successor. Mr. Miller said that the new president will give his entire time to his office and will aid in helping to solve the East Bay transportation problem.

Paul S. Clapp Executive Head of N.E.L.A.

Paul S. Clapp, Washington, D. C., has been appointed executive head of the National Electric Light Association. This appointment follows the acceptance by the executive committee of the resignation of M. H. Aylesworth, managing director, who, as noted previously in the *ELECTRIC RAILWAY JOURNAL*, is to become president of the newly organized National Broadcasting Company, Inc.

Graduated from the Iowa State College at Ames in 1913 as a bachelor of science in electrical engineering, and ten years later attaining the professional degree of electrical engineer by award of his alma mater, Mr. Clapp has an excellent engineering ground-work for the post he is to assume. In September, 1913, he found his first employment in the Chicago factory of the Western Electric Company. In February, 1914, he advanced to the same company's engineering department in New York, remaining there until February, 1917.

In February, 1917, Mr. Clapp became assistant purchasing agent of the Allied Machinery Corporation, a subsidiary of the American International Corporation, remaining until September of the same year, when he was commissioned a first lieutenant in the Signal Corps of the United States Army and became division signal supply officer of the Thirty-third Division at Camp Logan, Tex. Later, while in charge of the field trial and responsible for the final engineering approval of all radio and telegraph apparatus for airplanes, tanks and field sets at the radio laboratories at Little Silver, N. J., he won promotion to a captaincy in the Signal Corps.

From December, 1918, to February, 1919, Mr. Clapp served on the peace commission in Paris as a member of

the committee for the determination of damage in allied countries, and afterward he was affiliated with the American Relief Administration for Central and Southeastern Europe. After finishing that work Mr. Clapp for a year assisted in re-establishing cordial relations in the business interchange between American and western European industries and then sailed with Col. William Haskell and his original American Relief Administration party from New York to Russia.

Returning to this country, Mr. Clapp was appointed special assistant to the Secretary of Commerce in engineering, economic and commercial problems of the United States.

Jasper Johnson, general superintendent of transportation for the Aurora, Elgin & Fox River Electric Company, Aurora, Ill., was to leave on Nov. 1 to become manager of through lines and Michigan City, Wis., local lines of the Shore Line Motor Coach Company, operating between Chicago and Grand Rapids, Mich. Mr. Johnson has been with the Aurora, Elgin & Fox River property for sixteen years.

Obituary

F. M. Webster

Frank M. Webster, claim adjuster for the Grand Rapids Railway, Grand Rapids, Mich., for nearly 35 years, died suddenly on Oct. 30. Mr. Webster had not been in good health for some time, but he attended to his duties the day before he was stricken.

Mr. Webster entered the employ of the Valley City Street & Cable Railway, later consolidated with the Grand Rapids Railway, on July 17, 1891. After a year as conductor of a cable car he became claim adjuster, a position he had held since that time. In point of service he was one of the three oldest employees of the Grand Rapids Railway. In spite of the difficulties of his duties, Mr. Webster filled them with rare tact and diplomacy, always fostering the good will that existed between the public and his company.

Mr. Webster was born in Paris township, near Grand Rapids, in April, 1859. His parents were pioneers in western Michigan. He was a 32d degree Mason, being a member of York Lodge, F. & A. M., DeWitt Clinton Consistory, Scottish Rite, and Saladin Temple, Mystic Shrine.

John Larue Forkner, the first treasurer of the Union Traction Company of Indiana, Anderson, Ind., died recently. Mr. Forkner had lived in that city 60 years and had served respectively as sheriff, county auditor, councilman, city clerk and twice as Mayor of the city. He was 82 years old.

Edmond Alfred Hopkins, promoter of the Darby, Media & Chester Railway, now included in the system of the Philadelphia Rapid Transit Company, Philadelphia, Pa., died on Oct. 31 in that city. He was at one time connected in a managerial capacity with a railway property in London, England. He was 69 years old.

Manufactures and the Markets

News of and for Manufacturers—Market and Trade Conditions
A Department Open to Railways and Manufacturers
for Discussion of Manufacturing and Sales Matters

Akron Engineers Visit Timken Plant Via Northern Ohio Car

Forty-three members of the Akron Section, American Institute of Electrical Engineers, visited the plant of the Timken Roller Bearing Company in Canton, Ohio, on Oct. 16, to inspect the work of the various departments. Particular interest was manifested by the visitors in the steel mill, where five Heroult electric furnaces are in constant use to produce the highly refined alloy steel used in the manufacture of Timken bearings. The other departments of the steel mill and the bearing plant were also visited. Here more than 160,000,000 Timken bearings have been made. At the conclusion of the visit the experimental laboratories were shown.

In reaching the Timken plant the party used the new Northern Ohio Power & Light Company interurban parlor car. On this car the engineers were able to see Timken bearings in actual operation in the journal boxes.

Car Wheel Contract in Seattle Awarded

A contract for furnishing 200 33-in. and 100 26-in. car wheels for the Seattle Municipal Street Railway, Seattle, Wash., was awarded by the Board of Public Works on Oct. 15 to the Bethlehem Steel Company on that corporation's bid of \$34 each for the 33-in. wheels and \$24.50 for the 26-in. wheels. The contract involves an expenditure of \$9,250. At this same session the Board of Public Works awarded a contract for furnishing 10 miles of No. 2/0 hard-drawn copper trolley wire for the railway department to the Pacific States Electric Company for \$16.95 per hundredweight and 10,000 ft. of No. 8 arc duplex two-conductor cable to the North Coast Electric Company for \$65 per thousand feet.

Ohio Brass to Have New Office Building

Much-needed larger working quarters will be provided for the general offices of the Ohio Brass Company when the new administration building at Mansfield, Ohio, is completed. Construction work started Oct. 1. The general offices at present are housed in the oldest building of the plant.

The new office building will cost approximately \$500,000. It is to be a five-story steel and brick structure with stone trim, 255x52 ft., and having reinforced concrete floors. Construction will be fireproof throughout. The general layout and appointments will compare favorably with the finest factory office buildings erected in recent years.

Provision is made for a 25 per cent

increase in office force over present requirements, so that the company is planning well for the future.

Ample space will be provided officers and general sales officials and the seven divisions handling the sales of Ohio Brass products in the five industries served by this company. In addition there will be a permanent display room on the top floor. A conference room, seating 350, will be provided on the fifth floor, to be used for sales meetings and the like.

Little Known Facts About Mica

Very comprehensive is the little book entitled "Mica and Mica Products" which has just been published for distribution by William Brand & Company, New York, N. Y. Little information, strictly technical or otherwise, has heretofore been available on the subject of mica, and this discussion of the subject by Richard Schroeder, a noted German authority on the subject of electrical insulating material, should do much to clear up any misapprehensions existing on the subject of the technical properties of mica. The material contained in the booklet is an excerpt from a series of lectures on electrical insulating materials delivered before various technical institutions and societies of Berlin by Prof. H. Schering. Copies of the booklet will be sent to any railway man interested by William Brand & Company.

Wide Range of Orders Reported by Yellow Manufacturing

Sales by the Yellow Manufacturing Sales Corporation, Chicago, Ill., to electric railways are holding up well. Between Sept. 1 and Sept. 30 the company reports a long list of sales made in this field. Units vary in size from a single vehicle to fleets of considerable size, and the sales cover a variety of types of bodies and chassis.

Sales included orders from the Los Angeles Railway, Los Angeles, Cal., for two 230-in. wheelbase double-deck and one Model X, 21-passenger pay-enter coaches; Virginia Electric & Power Company, Richmond, Va., two units, Model Z-230-in. chassis; Northern Ohio Power & Light Company, five units, Model Y chassis; Wisconsin Public Service Corporation, Green Bay, Wis., one unit, Model X, 21-passenger pay-enter coach; Southern Indiana Gas & Electric Company, Evansville, Ind., four units, Model Z, 29-passenger city service coach; Bamberger Electric Railroad, Salt Lake City, Utah, two units, Model Y parlor coach; Danbury Power & Transmission Company, eight units, Model X, 21-passenger pay-enter coach; Austin Street Railway, Austin, Tex., one unit, Model X, 21-passenger pay-enter coach, and the Evanston Bus

Company, subsidiary of the Evanston Railway and the Chicago, North Shore & Milwaukee Railroad, two units, Model X, 21-passenger pay-enter coach.

No Lack of Activity in the Sisson Supply Company

"Pop" Sisson started something in February of this year. The "something" was the Sisson Supply Company, which consists of A. H. Sisson and his two sons, H. R. and Donald M. Sisson. "Pop" Sisson, as he is familiarly known throughout the railway industry, is one of the old-timers in the supply business. So this new venture of his is no wandering into foreign fields.

He started in the electric railway supply business in 1897 as one of the organizers of the Jewett Car Company, located at Jewett, Ill. In 1904 he went with the St. Louis Car Company, first as manager of the New York office and later as general manager of the company. In 1908 he became general manager of the Forsyth Brothers Company in Chicago, and in 1912 president of the Southern Car Company, High Point, N. C. Later he joined the National Pneumatic Company and still later the Columbia Machine Works, always centering his attention upon the various needs of the railway field.

This latest move of his, taken in conjunction with his two sons, is the culmination of a lifetime of training and preparation for just such work as this. The Sisson Supply Company will have for its territory the states of New York, Pennsylvania, New Jersey, Maryland, New England States and Washington, D. C. Among the manufacturers whom the Sisson Supply Company will represent are the following: Massachusetts Mohair Plush Company, Cleveland Tanning Company, Wheeling Corrugating Company, Chaton Fiber Company, Leon R. Wolf Weatherproof Fabric Company, Wright Rubber Products Company and the Industrial Products Corporation. The headquarters of the Sisson Company will be located at 1845 Grand Central Terminal Building, New York City.

Patent Suit Against Interborough Is Dropped

In a patent infringement suit brought by Samuel Thomas Walkup against the Interborough Rapid Transit Company, New York, N. Y., the United States District Court held that the railway had not infringed Walkup's patent on a car door control system for use in cars which are operated in trains. It was claimed by the plaintiff that the Interborough had adopted features of the patented control system which "has for an object to provide a control system whereby the platform men at the stations may operate the doors and whereby the number of cars controlled by a single platform man may be varied as desired . . . improved control system comprises a series of contact rails which are located at the stations above the tracks and at sufficient height to clear the cars, being secured to any suitable part, in this case the roof of the subway station."

The Interborough company was held

by the court not to have infringed the patents in its door-operating mechanism, since "the defendant did not use a contact rail or a series of contact rails adjacent to which a car or train is adapted to come to rest. The defendant uses motor armature resistance on some of its cars and light resistance on others to reduce the voltage of the third rail. Storage batteries are on all of its cars for the storage of energy to operate its doors." The bill was dismissed by the court on Oct. 18.

Westinghouse "At Home" All Year in Atlantic City

A year-round exhibit by the Westinghouse Electric & Manufacturing Company of Pittsburgh, Pa., has been opened in Atlantic City, N. J. The purpose of this exhibit is to display to the public electrical devices for transportation and marine business, industrial and home requirements. The exhibit is located on the ocean frontage of the Shelburne Hotel, almost opposite the Million Dollar Pier.

Prohibition Director Appeals for Manufacturer Co-operation

An appeal to big business heads throughout the country to assist in enforcing the prohibition law has just been made by Gen. Lincoln C. Andrews, Assistant Secretary of the Treasury in charge of prohibition enforcement, through the Citizens' Committee of One Thousand. This committee has sent copies of General Andrews' appeal to 14,000 business executives located in every part of the United States. The text of General Andrews' letter is as follows:

"Here is an idea which, if made effective, should be tremendously helpful to law enforcement; I believe that you and your organizations are the only agency to put this thing over.

"I know, from personal experience, that the big sales agencies for large manufacturers very often make it a practice to supply generous quantities of liquor by way of entertainment upon all manner of occasions, where their customers are meeting together for one purpose or another.

"For example, I was in the street railway business for some four years before taking this office. On every occasion, where the street railway men get together as in their annual state and national conventions, these agents of railroad supply houses were always present as delightful hosts dispensing unlimited quantities of liquor for the jollification of the occasion. What is true in this business is undoubtedly true in other big businesses.

"It always struck me as unreasonable, even from the economic point of view, because in the end the purchaser pays for the costs of sa'esmanship. But let us look at it from the prohibition point of view. It is generally accepted that big business favors the prohibition law and its enforcement—so far as industrial labor is concerned. Certainly in the railroading world, and in many other businesses as well, man-

Roanoke Cars Now in Operation



Delivery was made some time ago of six light-weight passenger motor cars to the Roanoke Railway & Electric Company, Roanoke, Va., by the J. G. Brill Company, Philadelphia, Pa. These units will be used in city and interurban service in Roanoke and the territory served by the railway. Seats for 44 passengers have been provided, these being of the Brill Winner type.

The principal specifications of the new cars are as follows:

Weights:	
Car body	1,700 lb.
Trucks	10,560 lb.
Equipment (electric and air) ..	8,570 lb.
Total	36,130 lb.
Bolster centers, length	13 ft. 10 in.
Length over all	41 ft. 4 in.
Truck wheelbase	5 ft. 4 in.
Width over all	8 ft. 6 in.
Height, rail to trolley base	11 ft. 0 1/2 in.
Body	Semi-steel
Headlining	Agosote
Roof	Arch
Air brakes	Westinghouse Traction Brake Co. straight air

Bumpers	Channel
Car signal system	Consolidated
Car trimmings	Polished bronze
Center and side bearings	Brill
Control	Westinghouse K-35KK
Curtain fixtures	Curtain Supply Co.
Curtain material	Pantasote double faced
Destination signs	Electric Service Supplies Co.
Door-operating mechanism	National Pneumatic
Fenders	H-H lifeguards
Gears and pinions	Forged steel
Hand brakes	Peacock staffless
Heater equipment	Consolidated
Headlights	Golden Glow SP-95
Journal bearings	MCB
Journal boxes	3 1/2 in. x 7 in.
Motors	Four Westinghouse 510-A, inside hung
Paint	Flood & Conklin
Sanders	Ohio Brass
Sash fixtures	Brill
Seats	Brill Winner
Seating material	Cherry wood slats
Slack adjuster	American type E
Springs	Brill
Step treads	Universal
Trolley catchers	Knutson No. 5
Trolley base	US-12
Trucks	Brill 77-E-1
Ventilators	Garland Type C-1
Wheels	A. C. & F., 33 in.

agement disapproves drinking on the part of employees.

"Now, let us look at the picture. Big manufacturing business, through allowing or rather fostering these expense accounts for large quantities of entertainment liquor, is making a considerable part of the market for liquor, which in turn brings into existence and supports the organized liquor traffic which furnishes the liquor. How inconsistent on the part of these big businesses who claim they want the law enforced. Again, the employees of the railroads, etc., are pretty generally aware of these convivial practices at conventions, etc., and what an unfortunate example to these employees that their management personnel are thus taking these occasions for drinking parties!

"My sole interest in this is the elimination of just that much market for boot'eg liquor—a market which is ready to pay any price and is thus sure to have its demand supplied. My thought is that if this picture can be properly presented to big businesses throughout the country they will readily enough agree to cut out this practice. They

have only to take the stand that no 'expense money' used for the purchase of liquor will ever be authorized.

"If you can undertake to put this over, I will be much obliged and, of course, you may use this letter in any way you see fit."

Another Chapter in Seattle Car Purchase Story

Plans for the purchase of 80 new cars for the Seattle Municipal Railway are apparently doomed. Corporation Counsel T. J. L. Kennedy has issued an opinion that the Board of Public Works has no power to amend the car purchase contract, as asked by attorneys of the St. Louis Car Company, to which the contract for the cars was awarded. The company submitted several proposed amendments a few weeks ago after a question had been raised as to validity of any bonds issued to pay for the cars. Mr. Kennedy points out that to amend the contract after it has already been awarded would set a dangerous precedent and violate the principle on which bidding and awards are based.

One of the provisions asked would permit the car builder to rescind its contract if it should fail to receive a railway warrant when due in payment for the cars or fail to obtain immediate cash for any warrant when presented at the bank. Other demands were that the company continue in possession until the cars are actually turned over to the city in the Seattle shops; that the \$1,875,000 bond issue be segregated so that payment would be made from an issue designated for street cars only; that all warrants outstanding against the construction fund of the railway department be paid before any warrants in payment for the cars are due to the company; that the contract be automatically extended should there be any litigation concerning the deal or the bonds; that the furnishing of a surety bond by the company depend upon the approval by its attorneys of the marketability of the bonds.

Track and Line

Milwaukee Electric Railway & Light Company, Milwaukee, Wis., plans to double track its Wells-Downer line on Downer Avenue from Edgewood Avenue north to Atwater Road in Shorewood. The total cost of this work will be \$26,000. Reconstruction of the Kinnickinnic Avenue tracks between Oklahoma Avenue to the new city limits at Ludlow Avenue will soon be under way. This job will cost approximately \$64,900. In Racine extensive railway improvements are under way at the Monument Square curve, where tracks are being torn out and replaced with heavier rails and steel ties.

Goose Creek, Tex.—Right-of-way for the Houston, Baytown & Goose Creek Interurban Railway has been secured and grading and track laying are making rapid progress, according to Harry K. Johnson, president. Track has been laid from Goose Creek to the San Jacinto River, and the contract for the construction of a bridge across the river has been awarded to the Austin Bridge Company. The total cost of the road's construction will be approximately \$1,600,000, according to Mr. Johnson. The cars of the new line will enter Houston over the tracks of the Houston Electric Company.

Chicago Surface Lines, Chicago, Ill., has started work on the extension in West 79th Street from Ashland Avenue to Western Avenue, and according to the engineers in charge of the construction the line should be completed in about six weeks. The extension is 1 mile in length. The trolley wires have been strung over the new roadbed. Now the work of excavating in the open space left in the new concrete paving is being done and the laying of ties and rails will be under way within a few days.

Los Angeles Railway, Los Angeles, Cal., will complete the reconstruction of its car tracks in the downtown district by Nov. 1. All rail used was the heavy 116-lb. girder rail. The entire length of track reconstructed in this district will be, when complete, 3.625 miles.

Harrisburg Railways, Harrisburg, Pa., will extend its Market Street tracks

to the new John Harris High School following the passing of the ordinance allowing franchise rights for the construction. Under the provision of the ordinance, the new stretch will extend 2,700 ft. east from 21st and Market Streets bringing the end of the track near the main entrance to the school building.

Trenton & Mercer County Traction Corporation, Trenton, N. J., has begun preliminary work in connection with the erection of a carehouse and a garage on East State Street. Nine switches will be placed in front of the proposed building and 750 ft. of new rails and roadbed will be laid on South Olden Avenue.

Trade Notes

Andrew J. Ryan has been added to the list of Kemi-Suede representatives. Mr. Ryan will take care of the Southern territory for the Leon L. Wolf Waterproof Fabric Company, Cincinnati, Ohio.

Evan J. Parker, formerly of the Morgan Engineering Works, Alliance, Ohio, has joined the forces of the Northern Engineering Works, Detroit, Mich., manufacturer of material-handling equipment such as electric and hand cranes, electric and air hoists, foundry equipment, etc. Mr. Parker will have charge of the sales promotion division.

C. W. Sproull of the firm of Allen, Sproull & Allen, Fort Worth, Tex., manufacturers' representatives, recently visited Bridgeport to complete arrangements to represent the Bridgeport Brass Company in the Southwest for the sale of the Bridgeport line of plumbing goods, Plumrite brass pipe and fittings and Bridgeport-Keating flush valves.

R. C. Brower has recently been appointed general manager of the Timken Roller Bearing Service & Sales Company, Canton, Ohio. The company maintains 25 direct factory branches and several hundred authorized distributors. Mr. Brower will make his headquarters in Canton, but will devote a considerable portion of his time in maintaining contact in the field. He is well known in the bearing industry, having been associated with it since 1913, and for the past four years with the Timken company.

Metal, Coal and Material Prices

Metals—New York		Nov. 3, 1926
Copper, electrolytic, cents per lb.	13.725	
Copper wire, cents per lb.	16.00	
Lead, cents per lb.	8.00	
Zinc, cents per lb.	7.60	
Tin, Straits, cents per lb.	69.75	
Bituminous Coal, f.o.b. Lines		
Smokeless mine run, f.o.b. vessel, Hampton Roads, gross tons	\$9.75	
Somerset mine run, Boston, net tons	4.125	
Pittsburgh mine run, Pittsburgh, net tons	4.00	
Franklin, Ill., screenings, Chicago, net tons	1.725	
Central, Ill., screenings, Chicago, net tons	1.45	
Kansas screenings, Kansas City, net tons	2.35	
Materials		
Rubber-covered wire, N. Y., No. 14, ptr 1,000 ft.	\$5.75	
Weatherproof wire base, N. Y., cents per lb	17.75	
Cement, Chicago net prices, without bags	2.10	
Lined oil (5-bbl. lots), N. Y., cents per lb.	11.70	
White lead in oil (100-lb. keg), N. Y., cents per lb.	15.25	
Turpentine (bbl. lots), N. Y., per gal.	\$0.88	

New Advertising Literature

Westinghouse Traction Brake Company, Pittsburgh, Pa., has issued descriptive catalog T-2032, entitled "Motor-Driven Air Compressors." This catalog covers compressor types 3VS and 3VD and is dated September, 1926, superseding the issue of October, 1924.

Southern Manganese Steel Company, St. Louis, Mo., has published a booklet on "Fahralloy" castings, which is a trade name given to a series of alloys developed to meet varying heat-resisting and corrosion-resisting conditions. The pamphlet gives the general characteristics of "Fahralloy," together with illustrations of various forms of castings which are produced.

General Electric Company, Schenectady, N. Y., has issued an illustrated folder intended to show that in every phase of handling of materials G. E. motorized power has paid. Examples are offered of the G. E. locomotive in haulage jobs, the tractor in cutting handling costs, the trucks which save while they serve and the "world of cranes" actuated by G. E. alternating or direct-current motors.

Pyle-National Company, Chicago, Ill., has completed the third edition of its No. 101 general catalog of railway electrical equipment. This latest edition describes a number of recent developments in locomotive headlight case construction, as well as giving data on the Pyle-National Company's established line of turbo-generators and yard floodlights. A representative selection of the Oliver wiring appliances for locomotive, car and shop wiring is included, although the full line of Oliver material is presented in a separate catalog. New and complete information on locomotive headlight mountings and recommended wiring for locomotive lighting is presented, together with tables, diagrams and material lists. Copies may be obtained from the general offices of the Pyle-National Company, Chicago, or from the branch offices in St. Paul, Minn., St. Louis, Mo., and New York City.

R. D. Nuttall Company, Pittsburgh, Pa., has issued bulletin No. 52 entitled "Nuttall Products for Electric Railway Service." This bulletin succeeds bulletin No. 35 of the same title. The later publication, however, is not a reprint of the earlier catalog as it has been completely rewritten and a large amount of new material included. A complete discussion of helical gears for street railway service is included, covering such items as analysis of helical gear meshing, quietness of helical gears, preservation of tooth contour, allowable wear, etc. Further, the publication covers spur gears, super tooth pinions, spread centers, trolley poles, harps, trolley bases, pantagraph trolleys, and various similar items.

Harry M. Perry, Los Angeles, Cal., has issued a leaflet giving new pulley horsepower data. This should be of interest in railway machine shop practice. A description of the advantages and principle of operation of the belt-slacker drive is also included.

ELECTED

By an overwhelming Majority!

The electric railway industry, including all types of service, prior to and since the launching of the intensive modernization doctrine of recent years, has cast an overwhelming majority vote for

PEACOCK STAFFLESS BRAKES!

Follow the installations of modern cars! In almost every instance you will find *Peacock Staffless* included in the specifications.

Such confidence must be merited!

Peacock Staffless Brakes have a demonstrated capacity for winding in 144 inches of chain—so that even though chains are slack and brake shoes worn, adequate braking is assured at all times. They have three times the braking power of the ordinary hand brake. They are light in weight, occupy little space and improve the appearance of car platforms.

We will gladly send you facts and figures proving what these brakes have done for others and what they will do for your cars.



National Brake Co., Inc.

890 Ellicott Sq., Buffalo, N. Y.

Canadian Representative:

Lyman Tube & Supply Company, Limited, Montreal, Canada



Eliminating "Grief" in Rate Litigation

"If every report that came before us was as good as this, it would save both the Commission and the utilities of this state a lot of grief."

This comment was made by a State Public Utility Commissioner after inspecting an American Appraisal. His praise was aroused by the clarity with which unit costs had been established, the detail in which the values were presented, the irrefutable chain of evidence supporting the determination of indirect and intangible costs, and the logical continuity and arrangement with which the entire report was presented.

This point of view is common to those who know American Appraisals. It is important to those others who contemplate presenting a valuation of their properties before Court or Commission.

The American Appraisal Company

MILWAUKEE

PUBLIC UTILITIES • INDUSTRIALS • REAL ESTATE PROPERTIES • NATURAL RESOURCES

A NATIONAL ORGANIZATION



Fleet of four Studebaker Busses, two 21-passenger street car type, two 20-passenger parlor cars, purchased by the Ohio Valley Bus Co., a subsidiary of the American Gas & Electric Co. of Huntington, W. Va.

Studebaker Bus Service Taps Profitable Areas

Ohio Valley Bus Company Opens New Territory
with Four Studebaker Busses

AGAIN Studebaker Busses have been bought on the strength of their unapproachable record for stamina and economy.

The Ohio Valley Bus Company at Huntington, W. Va., recently put four Studebaker busses in service as feeders to electric lines. The decision to buy Studebakers was influenced by irrefutable evidence of Studebaker superiority. Accurate cost records of more than 1200 Studebaker bus operators prove that Studebaker busses are most profitable to operate.

Standardized design and large scale production are responsible for the remarkably low first cost of Studebaker busses. The first cost of the Studebaker bus is but half that of the average large capacity bus. Therefore, the same investment buys twice the amount of equipment. This enables the operator to give more frequent and flexible service, providing modern transportation to communities too widely scattered for profitable traction line operation. Lower operating costs, long life and low depreciation of Studebaker busses are attributed to the fact that Studebaker busses are 50% lighter than the heavy truck type bus.

Records of many experienced bus owners show that Studebaker busses operate for 7 to 9 cents less

than heavy truck type equipment. In daily performance Studebaker busses demonstrate their profit earning qualities. On long runs over rural routes or tapping suburban areas Studebaker busses show a profit after the fifth passenger, which should be compared to the needed 8-passenger load to break even with the heavy truck type bus. Frequency of service builds good will and continued patronage.

Dependability is then of prime importance. There are in daily service more than 250 Studebaker Busses that have traveled upwards of 100,000 miles, some 200,000 even 300,000 miles and are still piling up profits. Such mileage figures show why there is exceptionally low depreciation in Studebaker busses.

The famous Big Six motor provides power aplenty. S. A. E. ratings certify that Studebaker is the most powerful bus chassis of its size in the world.

Pronounced rider comfort is found in the deep lounging seats, clear vision windows and scientific ventilation which insures restful travel.

Leading traction companies have proved the value of these Studebaker features. Mail the coupon for complete information on Studebaker Busses of all types.

L—first cost
—operating cost
—maintenance cost
—depreciation cost
Lower

Six Body Designs, 12 to 21 Passengers \$3935 to \$6150

Prices f. o. b. factory, covering body and chassis, complete. Purchase can be arranged on a liberal Budget Payment Plan—Small down payment and balance in convenient monthly installments.

12-Pass. (including driver) cross-seat Sedan-Type	\$3935
15-Pass. (including driver) cross-seat Sedan-Type	\$4295
18-Pass. (including driver) side-entrance Parlor Car	\$5300
19-Pass. (including driver) cross-seat Sedan-Type	\$5050
20-Pass. (including driver) Parlor-Car De Luxe*	\$6150
21-Pass. Pay-As-You-Enter Street-Car Type*	\$5125

*Includes dual rear wheels

THE STUDEBAKER CORPORATION OF AMERICA,
Dept. B, South Bend, Ind.

Send me full information on Studebaker Busses without obligation.

Name

Address

City

State

We have

busses at present.

Check below the Studebaker Bus about which you desire information.

Type: Sedan Parlor Car Street-Car Type

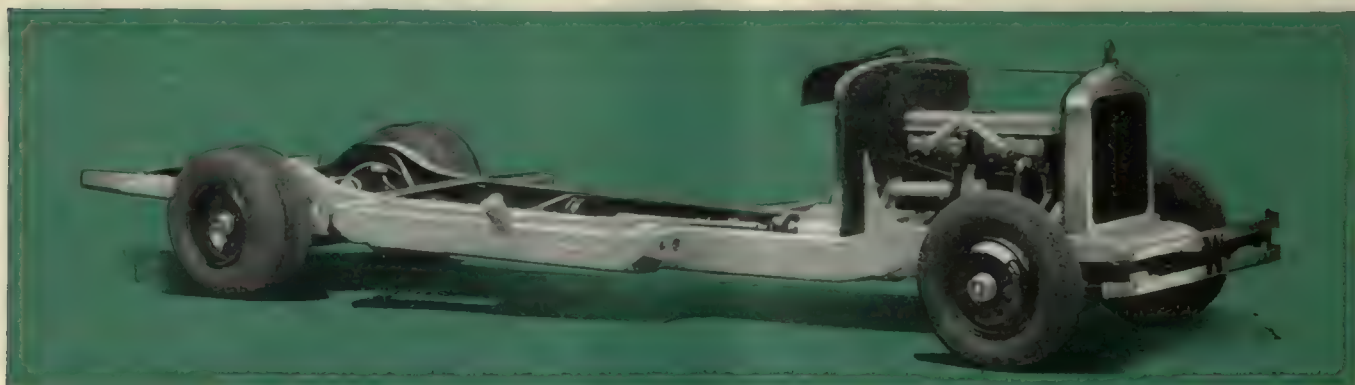
Capacity:

Passengers.

The New White

ADVANCED ENGINEERING FEATURES

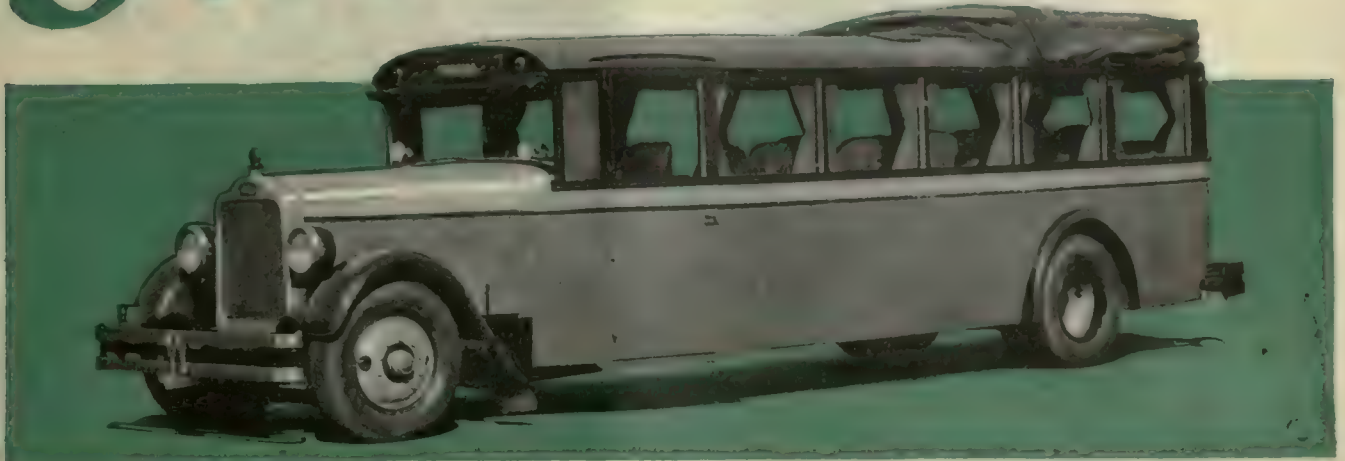
1. **100-H. P. ENGINE**—in the chassis, on the road.
2. **SEVEN - BEARING CRANKSHAFT** — 3" in diameter; main bearings mounted in deep, rigid crankcase.
3. **OVERHEAD VALVES**—All parts automatically and fully lubricated, fully enclosed.
4. **FOUR-WHEEL BRAKES**—Air compressor part of the motor; lubricated by the engine lubricating system.
5. **NINE-INCH BALLOON TIRES**—Balloon tires and easy steering; semi-center point steering; straight drag link; straight tie rod.
6. **DOUBLE DROP FRAME**—Security and comfort, carrying the load close to the road; easy entrance and exit.
7. **TWO STAGE SPRINGS**—Hotchkiss drive; springs 5' 4" long.
8. **SUPERIOR PERFORMANCE, ECONOMY AND COMFORT**—A new sensation in bus performance.



WHITE

FOURS

Six Bus



OPENS THE NEW ERA IN HIGHWAY TRANSPORTATION
/// ADVANCED ENGINEERING /// ADVANCED PERFORMANCE BEYOND ALL PRESENT-DAY STANDARDS

America's fast-growing highway system compels a greater bus. Meeting today's needs and ready for tomorrow's, the new White Six-Cylinder Valve-in-head Bus answers the public's demand for greater and greater ease, safety and speed of transportation.

A thoroughbred in appearance, with lines of grace and of power, the new White Six—one hundred horsepower—is the perfection of luxurious travel. With perfect ease of motion—vibration melted out com-

pletely—to ride in it is a new sensation in bus performance. Greater power for all purposes—smooth, silent, concealed power that eases motion and increases safety at all speeds—faster on the open highway—greater flexibility in traffic—finding no hindrance in hills, because power is there and under control at all times. For air brakes, metal to metal, on all four wheels, increase the feeling of security at any speed, coming to a dead stop in an incredibly short space without jar or effort.

Continued Manufacture of Four-Cylinder Busses

After long and rigorous tests, White engineers have produced a bus that is far in advance of present-day standards. It embodies the inseparable attributes of White reputation for economy, dependability and durability . . . the outgrowth of White's long experience as the outstanding leader in the motor bus industry. More White Busses are in service in this country than busses of any other high-grade make.

The adding of the White Six in no way lessens the important part the four-cylinder White Bus has and will continue to play in bus transportation.

Four-cylinder White Busses have always been money makers for their owners. They fill a definite need in the allied transportation systems of electric railways and other transportation fields. The White Company will continue to manufacture four-cylinder busses to meet the varied demands of bus operation. Back of every White Bus, both fours and sixes, is the stability of The White Company, its long and varied experience in transportation and its reputation for building only the best.

THE WHITE COMPANY, CLEVELAND

BUSSES

AND SIXES



Prominent operating companies are giving reliable true-to-schedule bus service at a profit—on Firestone Gum-Dipped Bus Tires

Firestone

GUM-DIPPED BUS TIRES

These big, wide flexible tires give extra protection to chassis and mechanism, while the gripping non-skid tread holds to the slippery road—giving passengers safety and comfort.

The Gum-Dipping Process—every fiber of every cord thoroughly rubberized—builds greater

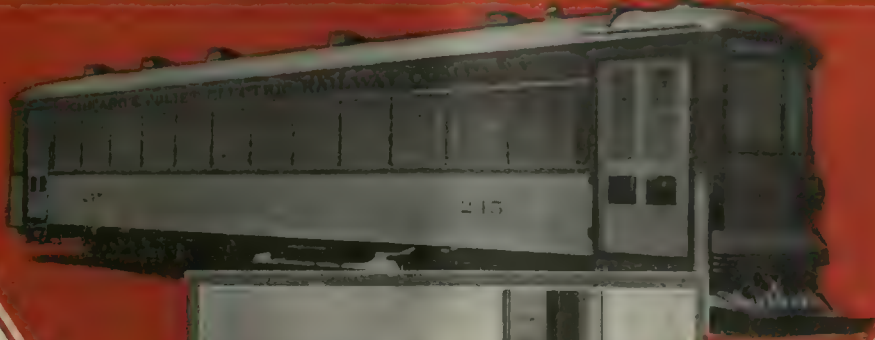
strength and endurance to meet the most strenuous bus service—assuring operators added economy and long trouble-free mileage.

Firestone engineers know your bus problems. They offer you experience and equipment that assures most efficient service with the added profits from—

MOST MILES PER DOLLAR

AMERICANS SHOULD PRODUCE THEIR OWN RUBBER.... *Harvey Firestone*

WINDOWS DO MAKE A DIFFERENCE



Car for Chicago & North Branch
Railway, by Cummings
Car & Coach Co., using
Edwards Metal Sash.

Edwards Storm Sash
adds to the comfort of
passengers and saves
heating costs.



Attract Patronage and Good Will

Keep pace with modern demands for passenger comfort!

You can measure the future success of your operations by the extent to which you modernize your equipment to develop passenger patronage and good will. Edwards Metal Sash has been designed to meet this modern trend in electric railway transportation. It replaces old-fashioned, heavy, rattly, drafty, fist-inviting windows with modern, quiet, light, air-tight, smooth sliding sash that gives a maximum of clear vision.

You benefit when you provide these passenger comforts. Edwards Metal Sash requires practically no maintenance. It makes windows easier to clean. Its years of service are unlimited. It greatly reduces the chances of broken glass and minimizes this danger to passengers.

Car builders will furnish Edwards Metal Sash on your specification. Send today for catalog which gives all details and plenty of illustrations.

O. M. EDWARDS CO.

New York

Syracuse, N. Y.

Chicago

Canadian Representatives:

Lyman Tube & Supply Co., Ltd., Montreal and Toronto.

Edwards Sash Metal

*The tire with
the Gum-Weld Cushion*



On city boulevard run or rocky motor stage route—the mileage records prove convincingly the advantage of INDIA tire construction.

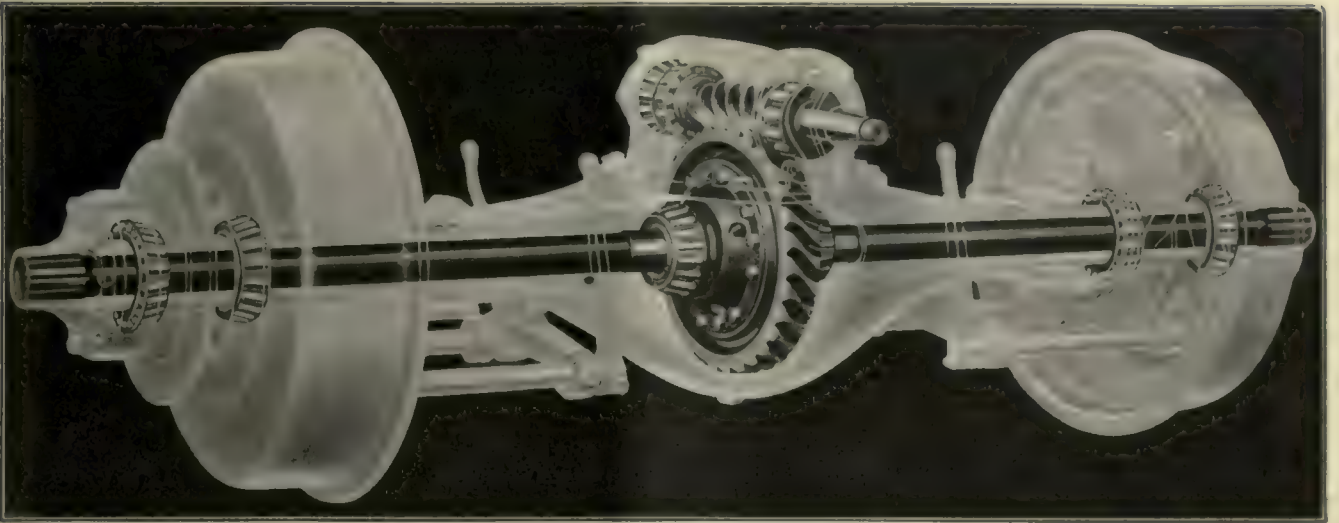
Built with INDIA'S Gum-Weld Cushion to absorb road shocks and a tread that gives utmost traction without cupping—it is no wonder that INDIA has become the most favorably talked about bus tire in America.

Now the True-Blue [HEAT-PROOF] Inner Tube with its Sure-Vulc splice, makes INDIA tires give even greater records of uninterrupted service.

INDIA TIRES



INDIA TIRE & RUBBER CO., AKRON, OHIO.



The Works of A Giant Watch Would Scarcely Be More Precise

than the worm gearing of a Timken rear axle. It is precision engineering of a type not usual in industry that makes Timken Axles so strong, so efficient, so dependable and so silent regardless of the miles that they have put behind them or the trials which they have undergone.



THE TIMKEN-DETROIT AXLE CO., DETROIT, MICH.

TIMKEN AXLES

The formula is



now fixed—

The results of **BALANCED DESIGN** can be duplicated on your property—

Outstanding, in the published accounts of successful new car operation, have been the records made by Cincinnati Lightweight New Cars,—built to the dominant principle of **BALANCED DESIGN**.


This is important to those railways which have not yet completed their modernization plans. Under this principle of car building, the basic formula is fixed. They can buy Cincinnati New Cars exactly suited to local conditions, without experiment and with every reasonable certainty of results.

▮ With both design and construction under one experienced control, preparation of lengthy

specifications is no longer necessary. Yet **BALANCED DESIGN** tends always to desirable uniformity of performance rather than actual standardization. It establishes major principles of modern car building which have definitely proved their worth. And it applies these principles so that the finished car becomes a highly perfected modern unit, the operating characteristics and business-producing ability of which can be gauged in advance.

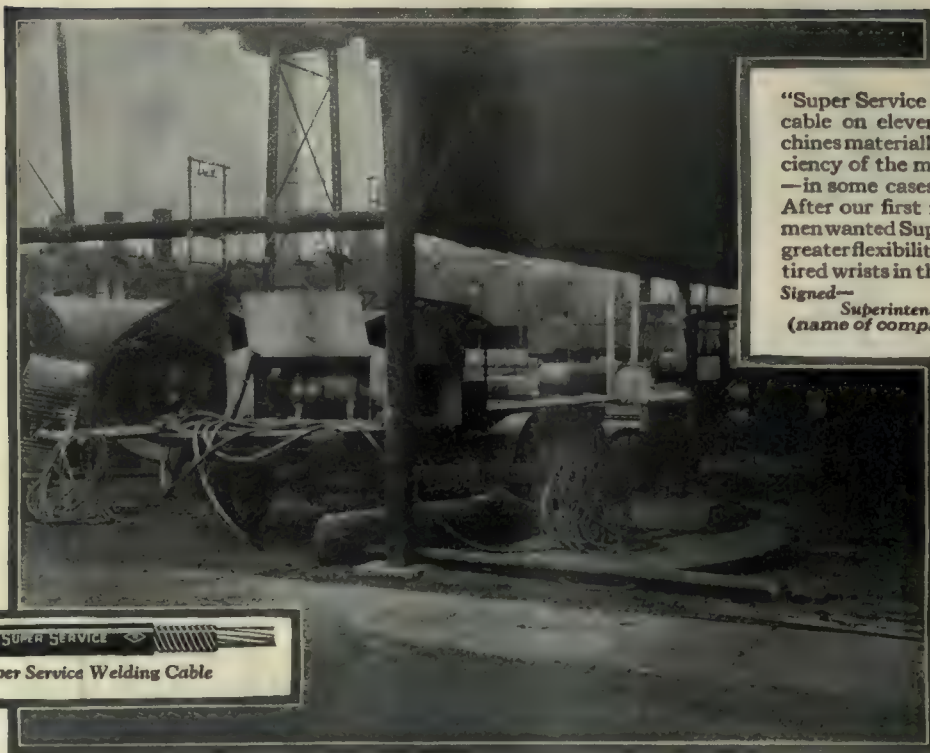
Full engineering and operating data immediately available to interested electric railway executives on request. Certainly, it will be easier to visualize your new car plans this way.

CINCINNATI CAR COMPANY
CINCINNATI, OHIO



CINCINNATI *New* CARS

A step ahead of the modern trend



"Super Service special arc welding cable on eleven arc welding machines materially increased the efficiency of the men doing the work—in some cases as much as 10%. After our first installation all the men wanted Super Service due to its greater flexibility and the absence of tired wrists in the early afternoon."

Signed—

Superintendent of Welding Dept.,
(name of company on application)

SUPER SERVICE
Special Super Service Welding Cable

No tired wrists with Special Super Service Welding Cable

YOU really have to work with Special Super Service Welding Cable to appreciate all its good qualities.

It can be twisted, looped and dragged about obstructions without injury. Yet it does not kink or tangle.

It can be used in damp places, or dragged through water, without danger for it is absolutely water-proof.

And above all it is so flexible that your wrist does not tire in the early afternoon. You can do more

and better work every day in the week.

This flexibility and toughness is due to our special process of manufacture. Every foot of Super Service is vulcanized, in steel molds, under tons of pressure. The outer jacket of rubber is compressed, until it becomes a tough, dense, yet extremely supple protective covering for the conductors.

If you would like to increase the output in your own welding department, order a length of Special Super Service Welding Cable today.

ROME WIRE COMPANY

Mills and Executive Offices: Rome, N. Y.

Diamond Branch: Buffalo, N. Y.

SUPER SERVICE CORDS and CABLES

A ROME WIRE PRODUCT

New York
50 Church Street

Boston
Little Building


Detroit
25 Parsons Street

Cleveland
1200 West 9th Street

Chicago
14 East Jackson Blvd.

Los Angeles
J. G. Pomeroy Co.
336 Azusa Street

San Francisco
J. G. Pomeroy Co.
960 Folsom St.



Co-ordinated Comfort

Comfort in seats means more fares in the fare box

Because they are the result of more than half a century's seat-building experience, H-K Seats are designed and built along the most comfortable and practical lines to meet the very requirement in bus and car operation.



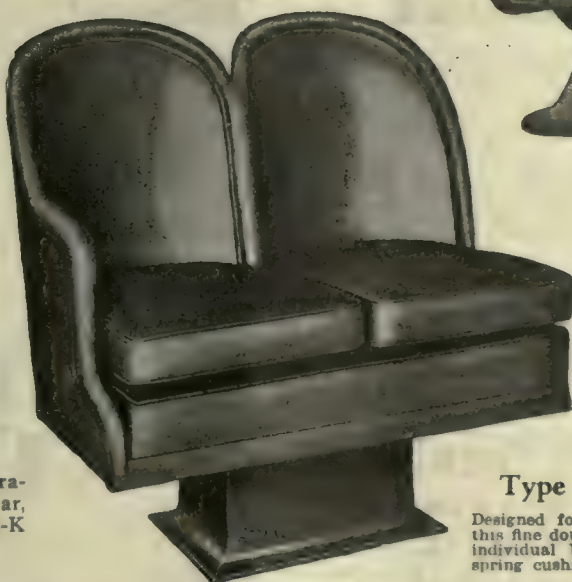
Type 300-A

Comfortable design combined with great durability adapts this car seat for hard city service.



Type 392-EE

Made for the finest interurban service this car seat has extra high three-part head-roll and mahogany capped arm-rest. Upholstered in plush or other materials as specified.



Type 900-A

Designed for bus service this fine double chair has individual backs and spring cushion pads.

Get the H-K Catalog

For complete descriptions and illustrations of our seats for both bus and car, send today for a copy of the H-K Catalog.

HALE-KILBURN COMPANY

General Offices and Works: 1800 Lehigh Avenue, Philadelphia

SALES OFFICES:

Hale-Kilburn Co., 30 Church St., New York
Hale-Kilburn Co., McCormick Bldg., Chicago
E. A. Thornwell, Candler Bldg., Atlanta

Frank F. Bodler, 903 Monadnock Bldg., San Francisco
Chris Eccles, 320 S. San Pedro St., Los Angeles
T. C. Coleman & Son, Starks Bldg., Louisville

W. L. Jefferies, Jr., Mutual Bldg., Richmond
W. D. Jenkins, Praetorian Bldg., Dallas, Texas
W. D. Jenkins, Carter Bldg., Houston, Texas
H. M. Euler, 46 Front St., Portland, Oregon

Hale and Kilburn SEATS

Announcing

a new grade of leather made to a Standard and originated and produced only by

The Cleveland Tanning Company

It is not made to compete against or imitate any other selection.

It is made to sell at a price midway between a Machine Buff and a Deep Buff and can be used anywhere that a bark tanned Machine Buff is being used at a *distinct saving in cost* and possessing merits far superior in *Strength, Mellow-ness and Wearing Qualities*.

It is not affected by *Heat, Cold or Moisture* and can be produced in any color combination and its production is limited to *one grade only*—the *Best*. We solicit your inquiries.

Nothing takes the place of leather.

The Cleveland Tanning Company

Dennison Avenue & Jennings Road, Cleveland, Ohio

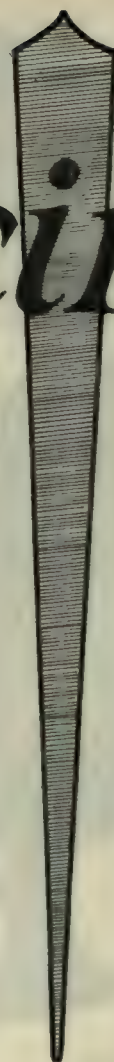
Western Representative:
Midgeley & Borrowdale,
McCormick Building,
Chicago, Ill.



Eastern Representative:
L. D. Rockwell Co.,
National City Building,
New York City

HYALINE

The Finest Coach Leather Obtainable



a
new
grade of
LEATHER



**for Street Cars
and Buses**





Chicago & Joliet Elec. Ry.
interurban car built by
Cummings Car & Coach
Co. Haskelite roof head-
linings and inside linings.

Lightweight cars lighten the fixed charges

Modern lightweight cars can usually be built at a lower first cost than the old fashioned heavy cars. That means lower interest and depreciation charges. But the big advantage is that they can be operated with less power and with less maintenance expense. Every unnecessary pound on a car is a dead load on your operating expense.

The most noteworthy present day example of lightweight in street car construction is the car that fully utilizes HASKELITE and PLYMETL in its design. Such a car can show a saving of 113 lbs. in the roof, 200 lbs. in the sub-floor, 300 lbs. in the exterior side panels, and 322 lbs. for numerous miscellaneous applications, making a total weight saving of 935 lbs. as compared with steel, wood, and composition bodies.

At 6c. a pound annual operating cost, this means a saving of \$56.10 every year for every car in service.

Why not take a load off your fixed charges by adopting the HASKELITE-PLYMETL car. Send for list of users and blue print booklet showing detailed applications.

HASKELITE MANUFACTURING CORPORATION, 133 West Washington Street, Chicago

Canadian Representatives:

Railway and Power Engineering Corporation, Ltd.
Montreal Toronto Winnipeg

Detroit United Line car
operating in Flint City.
Equipped with Plymetl
side panels.





Boyerized Boy pins Old Man Wear-and-Tear's shoulders to the mat!

Without any preliminary feinting the Boyerized Boy and Old Man Wear-and-Tear came to grips in as fierce a catch-as-catch-can match as any of the present generation ever saw.

The wonderful condition of the Boyerized Boy soon began to tell. For he easily stood the terrific pace while Old Wear-and-Tear quickly tired.

Although the result was never in doubt after the first few minutes the quick and decisive victory of the Boyerized Boy was a revelation to old timers who many times had seen ordinary steel parts meet with quick defeat at the hands of Old Man Wear-and-Tear.

This ability to withstand all opposition is the main factor in the popularity of Boyerized Parts throughout the electric railway industry.

Make your selections from the list shown. Then get quotations.

BOYERIZED PARTS

Brake Pins	Spring Posts
Brake Hangers	Bolster and Transom Chafing Plates
Brake Levers	Manganese Brake Heads
Pedestal Gibs	Manganese Truck Parts
Brake Fulcrums	Bushings
Center Bearings	Bronze Bearings
Side Bearings	
Spring Post Bushings	

It's
Boyerized



Bemis Car Truck Company

Electric Railway Supplies
Springfield, Mass.

REPRESENTATIVES:

Economy Electric Devices Co., Old Colony Bldg., Chicago, Ill.
F. F. Bodler, 903 Monadnock Bldg., San Francisco, Cal.
W. F. McKenney, 54 First Street, Portland, Ore.
J. H. Denton, 1328 Broadway, New York City, N. Y.
A. W. Arlin, 772 Pacific Electric Bldg., Los Angeles, Cal.



ONE of the new cars recently placed in service on the Chicago and Joliet Electric Railway line was exhibited at the Cleveland Convention.

And— Much favorable comment was aroused and visitors were decidedly

The management of the Chicago and Joliet Railway is gratified with the appreciation of these cars by the public, as evidenced by the increased riding that has already taken place.

impressed by this car. It was quite generally spoken of as combining, to an unusual degree, the desirable features of comfort, attractive appearance, and low cost of operation.

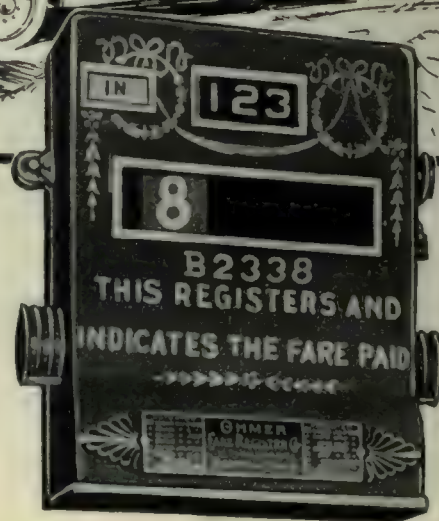
CUMMINGS CAR AND COACH COMPANY

Successor to McGuire-Cummings Mfg. Co.

111 W. Monroe Street, Chicago, Ill.



for Motor Bus and Electric Railway Service



The correct fare from every passenger and every fare correctly accounted for.

A system of fare collection to meet the requirements of modern transportation must do more than simply protect the fares from loss after they are collected. There must be some means of making the prompt payment of the correct fare a desirable thing from the standpoint of the passenger and the actual collection of the fare as well as its proper registration a desirable thing from the standpoint of the conductor.

This is accomplished by the "Ohmer System," which is the application of practical psychology to the problem of profitably merchandising transportation.

Put your problem up to us. We will help.

OHMER FARE REGISTER CO.

Address Dept. A

Dayton, Ohio, U. S. A.

OHMER

REG. U.S. PAT. OFF.

FARE REGISTERS



Grand Rapids "Blazed the Trail"

Many innovations in these new cars have proved popular with the public. They are featured by attractive appearance, interior comfort and quiet operation.

“IN the attractiveness and popularity of the new cars put on the streets of Grand Rapids by its railway company lies the key to building public interest and friendship. That alone will enable railway companies to win adequate rates of fare, relief from paving burdens and unfair franchise terms. Without popular support, public officials are powerless to deal intelligently and fairly with the problems of improving street railways service.”

EDWIN F. SWEET

Grand Rapids City Commission

Formerly Vice-Chairman Federal Electric Railway Commission

(Statement by prominent member of city commission indicating public reaction obtained from new cars)

The Grand Rapids Cars Are

Quality Cars

St. Louis Car Company
St. Louis, Mo.

"The Birthplace of the Safety Car"

A Quality Specification!

March 10, 1923

ELECTRIC RAILWAY JOURNAL

Manufactures and the Markets

News of and for Manufacturers—Market and Trade Conditions
A Department Open to Railways and Manufacturers
for Discussion of Manufacturing and Sales Matters

Details of Philadelphia Order for 576 Cars

On Jan. 22 the board of directors of the Philadelphia Rapid Transit Company authorized the lease and purchase by car trust agreement of 576 new cars of which 520 will be passenger cars. A brief note in regard to the order, which is said to be the single order for trolley cars in this country, was made in the issue of the ELECTRIC RAILWAY JOURNAL.

MANUFACTURERS OF EQUIPMENT. TOGETHER WITH TYPE FURNISHED

Air brakes G.E. Co.
Armature bearings Plain
Axles Carnegie Steel Co.'s heat treated
Bumpers Six-inch Channel reinforced
Car signal system Brill's standard and push
button contact bases—Faraday Type-E
Car trimmings
Center and side bearings Malleable and bronze statuary finish
Conduits and junction boxes Brill's standard
Control G.E. 2-K-68 with ratchet attachment
Couplers Drawbar pockets
Curtain fixtures Curtain Supply Co.'s No. 88
Curtain material Double face pantasote
Designation signs Hunter
Door operating mechanism
Gear wheels National Pneumatic Co.
Gearguards H. B. Life Guard
Gears and pinions
Heater equipment Tool Steel Gear & Pinion Co.
Headlights Consolidated Car Heating Co.'s
Hinges Crouse Hinds semi-horse lens
Hollow bearings Plain
Hollow cast-iron
M. P.

1040

"Tool Steel" gears
pinions

go on this new equipment.

A quality specification.

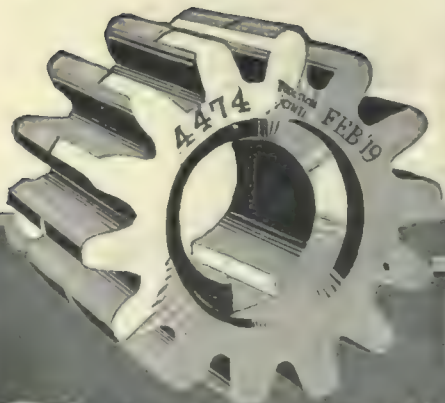
1923—1040 sets "Tool Steel"

1925— 200 sets "Tool Steel"

1926— 100 sets "Tool Steel"

Philadelphia believes in getting the best when they buy.

The Tool Steel Gear & Pinion Company
Cincinnati, Ohio



The Standard of Quality

TOOL-STEEL QUALITY

GEARS AND PINIONS



View of part of the Chicago South Shore and South Bend Railroad's right of way, near Miller, Ind.

Bates Semi-Fabricated Structures for the "Ideal Section" Overhead

The history of the "South Shore" line during the past year and a half is convincing testimony in favor of the "modernization" idea. Extensive rehabilitation and reorganization has attracted a large volume of new patronage, and is turning this property into a most profitable line.

Consistent with the policy of utilizing the highest type of equipment available, Bates Semi-Fabricated combination structures were selected for catenary supports on the "Ideal Section" near Miller, Ind. The view above is shown through the courtesy of the Ohio Brass Company who furnished the catenary material.

Bates Structures of Expanded Steel will be found ideal for every form of overhead construction—and a Bates estimate will prove very reasonable. Let us quote on your plans.

INTERNATIONAL
STANDARD ELECTRIC CORP.
General Export Distributors

SAMUEL BROWN, LTD., *New Zealand*
JOST ENGINEERING CO., LTD., *India*

BATES-TRUSS

Expanded
MADE
ONLY
BY

Bates **E**xpanded **S**teel **T**russ **C**o.

Sales, Engineering and Executive Offices
EAST CHICAGO, INDIANA

REINFORCED— TROLLEY POLES



THE "NATIONAL-SHELBY" Seamless Cold Drawn Steel Trolley Pole is made in two standard designs—Standard A and Standard B—from 13 gage material. Each type is reinforced as shown in the illustration; and by a special method of inserting, this reinforcement becomes practically integral with the body of the pole.

The length of reinforcement is varied to meet the requirements of strength. In the "A" pole the reinforcement is of sufficient length to prevent deformation of the circular section by the stresses caused in service or by the clamp on the trolley base. This is the lightest pole practical for use and is suitable for all ordinary service.

Pole "B" has a reinforcement of maximum length, and is intended to meet the most severe service conditions. Both types of pole are fully described in our booklet—"Seamless Cold Drawn Steel Trolley Poles." A copy sent upon request.

NATIONAL TUBE COMPANY

Frick Building, Pittsburgh, Pa.

DISTRICT SALES OFFICES IN THE LARGER CITIES



Quiet!

Quality Ties
Ready for Shipment
Now

Sound Proof Car Tracks

WOODEN ties absorb the shock and vibration of passing cars. They deaden disagreeable rumblings and subdue those clashing sounds at joints and special work.

And *International Creosoted Ties*, by lasting many times longer than untreated wood, maintain the line and surface of rails, insuring the smooth, quiet running of cars.

Your Association—the A. E. R. A.—is working toward noiseless operation. We submit as a practical first step—"Sound-proof your track construction with *International Creosoted Ties*." They are cut to standard specifications, carefully graded and thoroughly treated with the highest quality creosote.

*Prompt shipments from stock to
any point in the United States*

International Creosoting & Construction Co.

General Office—Galveston, Texas

Plants: Texarkana, Texas Beaumont, Texas Galveston, Texas



International

HIGH GRADE
CREOSOTED TIES

American Steel & Wire Company's ARCON RAIL BONDS

TRADE MARK REG.



Arcon A
Bond and
Application

To apply the Arcon "F" bond, hammer it onto the rail base and proceed to weld. The pointed hook holds the bond securely in place and will fit between tie and rail. An unusual amount of space is left to insure ease of welding.



Arcon "F" Bond

Arcon bonds make positive the welding of bonds with copper electrodes.

All unnecessary retaining walls have been omitted from these bonds. There are no box shaped metal pockets to interfere with directing the arc.

The open shape of the Arcon "A" terminal is especially desirable since the arc can be directed freely at the junction of the terminal and the rail.

Prices and descriptive literature sent on request.

Sales Offices

Chicago New York Boston Cleveland Worcester Philadelphia Pittsburgh Buffalo Detroit Cincinnati Baltimore
Wilkes-Barre St. Louis Kansas City St. Paul Oklahoma City Birmingham Memphis Dallas Atlanta Denver Salt Lake City

Export Representative: U. S. Steel Products Co., New York

Pacific Coast Representative: U. S. Steel Products Company, San Francisco, Los Angeles, Portland, Seattle



In Cincinnati—

a permanent foundation this time

The Cincinnati Street Railway Company this summer replaced the wood ties on Madison Road with Carnegie Steel Cross Ties, spaced 3 ft. center to center, and laid on the old concrete base.

The former track was laid in 1915—only eleven years of service. The new foundation is permanent—put down to stay. Temperature variations, water or decay will not affect it.

The initial cost of such construction has, in some cases, been less than that for wood ties.

Booklet, "Steel Cross Ties,"
will be sent at your request.

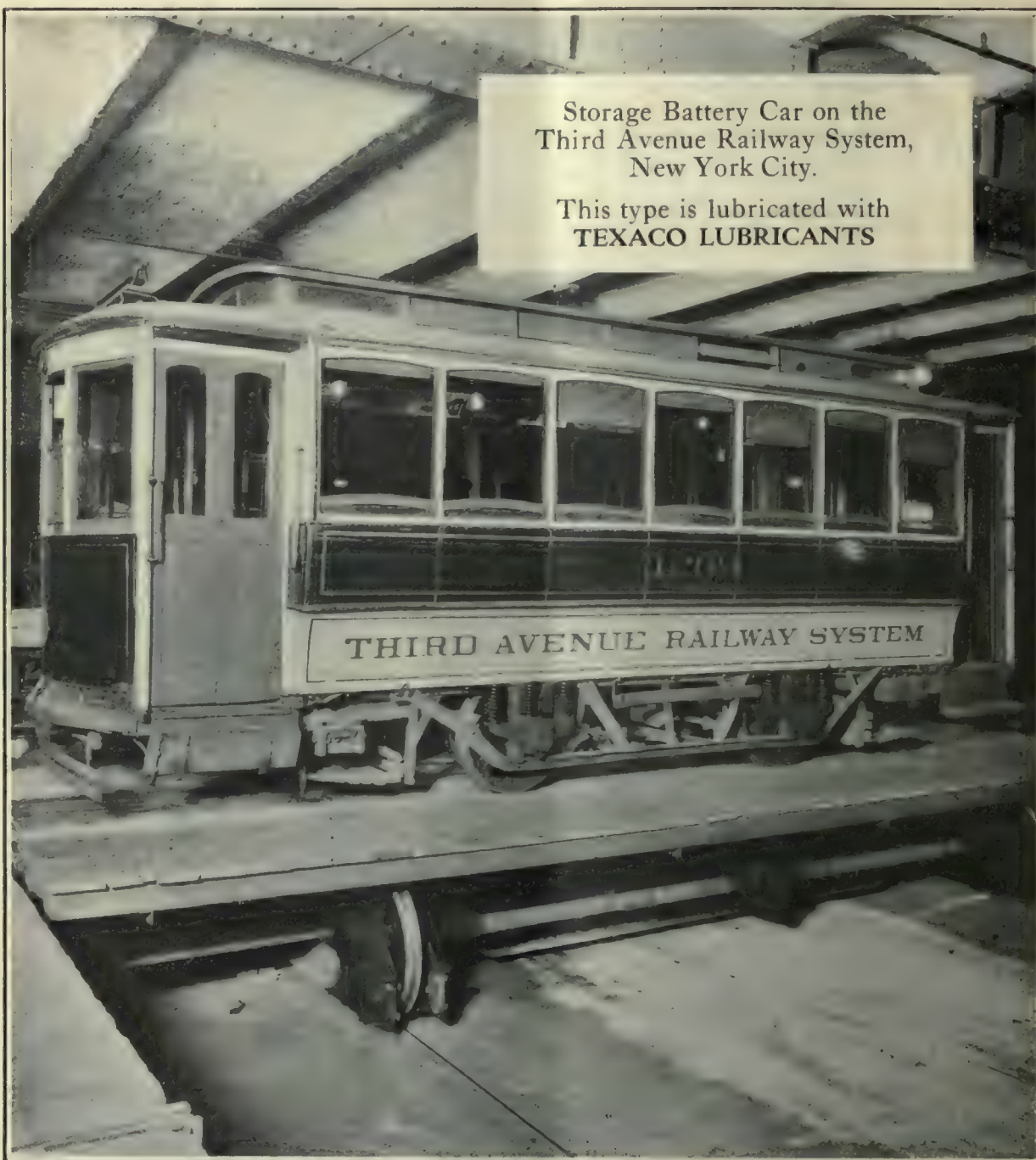
CARNEGIE STEEL COMPANY

General Offices - Carnegie Building - 434 Fifth Avenue

PITTSBURGH

PENNSYLVANIA





TEXACO



The Chosen Lubricant
of ELECTRIC RAILWAYS



The Texas Company, U. S. A., 17 Battery Place, New York City
OFFICES IN PRINCIPAL CITIES

CAMBRIA

ROLLED STEEL WHEELS

and

FORGED STEEL AXLES

Cambria rolled steel wheels and forged steel axles are manufactured in the Cambria Plant of the Bethlehem Steel Company in Johnstown, Pa.

LONG SERVICE and MINIMUM MAINTENANCE

Cambria rolled steel wheels and forged steel axles in Electric Railway Service insure maximum mileage and safety, require the minimum of maintenance and give long uninterrupted service.

Cambria wheels are made by a combined forging and rolling process, the forging giving strength, toughness and density to the metal, and the rolling establishing a grained structure which prevents breakage and crystallization.

Cambria forged steel axles are made from the finest selected stock and can be furnished rough-turned, heat-treated, annealed or untreated.

Control of raw materials and extensive facilities permit Bethlehem to produce Wheels and Axles of unusually high quality.



BETHLEHEM STEEL COMPANY, General Offices: BETHLEHEM, PA.

District Offices:

Boston	Philadelphia	Washington	Pittsburgh	Cincinnati	Detroit	Seattle	Los Angeles
New York	Baltimore	Atlanta	Cleveland	Chicago	St. Louis	San Francisco	Portland
Buffalo							

BETHLEHEM

1 ton or 1000

RAILS

F.B. FOSTER COMPANY
NEW YORK CHICAGO



Thirty-Two
Modern Up-to-date Cars
Just received by the
MEMPHIS STREET RAILWAY CO.
equipped with
Chilled Wheels

A.R.A. Standards

650 lb. Wheel for 30 Ton Cars
700 lb. Wheel for 40 Ton Cars
750 lb. Wheel for 50 Ton Cars
850 lb. Wheel for 70 Ton Cars

ASSOCIATION OF MANUFACTURERS
OF CHILLED CAR WHEELS
1847 McCormick Building
CHICAGO

50 Plants—Daily Capacities 20,000 Wheels

Nuttall

Nuttall Standard BP Helical Gears

People who use other means of transportation than your street cars do so for two reasons—convenience and comfort. Make your cars more comfortable, easier riding, convenient in design, and they'll not lack for increased patronage.



You can take a big step in the right direction without disorganizing present service and without re-financing—by equipping with Nuttall Helical Gears. They will eliminate all the racking noises and vibration of spur gearing—for Nuttall Helicals mesh like the turning of a screw.

Furthermore the BP Heat Treatment of Nuttall Helicals in itself guarantees at least four times greater gear life, quite apart from savings in maintenance effected through elimination of vibration, and the gears cost you about 70% less in the long run than untreated gears.



R.D. NUTTALL COMPANY
PITTSBURGH PENNSYLVANIA

All Westinghouse Electric & Mfg. Co. District Offices are Sales Representatives in the United States for the Nuttall Electric Railway and Mine Haulage Products. In Canada: Lyman Tube & Supply Co., Ltd., Montreal and Toronto.

Where performance counts

USE

Le Carbone Carbon Brushes

They talk for themselves

W. J. Jeandron

Hoboken Factory Terminal,
Building F, Fifteenth Street, Hoboken, N. J.

Pittsburgh Office: 634 Wabash Bldg.

Chicago Office: 1657 Monadnock Block

San Francisco Office: 525 Market Street

Canadian Distributors: Lyman Tube & Supply Co., Ltd.
Montreal and Toronto

ELECTRICAL INSULATION

MICANITE and EMPIRE
INSULATOR

Micanite Sheets for all Purposes
Micanite Commutator Segments
Micanite Commutator Rings
Micanite Tubes and Washers
Linotape, Seamless or Sewn Bias
(Yellow or Black Varnished Tapes)
Empire Oiled Cloths and Papers
(Yellow or Black)
Compounds, Varnishes, Etc.

Send for catalog and helpful booklet on Commutator
Insulation and Assembly

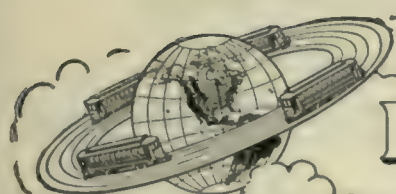
MICA INSULATOR COMPANY

Largest manufacturers in the world of mica insulation.

Established 1893

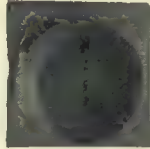
New York: 68 Church St. Chicago: 542 So. Dearborn St.
Works: Schenectady, New York. Victoriaville, Canada; London, England

The creation and maintenance of car advertising space values requires the same degree of highly specialized knowledge as the construction and maintenance of railroads. Such tasks should be delegated only to those of widest experience and longest record of success.



Barron G. Collier

INCORPORATED
CANDLER BLDG. NEW YORK



Complete satisfaction

Operating perfectly and requiring minimum attention for maintenance and lubrication, Earll Catchers and Retrievers give genuinely satisfactory results. Their refinement of design, and mechanical superiority are summarized in the following five features, peculiar to Earll construction.

No-wear Check Pawl
Free-Winding Tension Spring
Ratchet Wind
Emergency Release
Perfect Automatic Lubrication

Earll Catchers and Retrievers
C. I. EARLL, York, Pa.

Canadian Agents:
Railway & Power Engineering Corp., Ltd., Toronto, Ont.
In All Other Foreign Countries:
International General Electric Co., Schenectady, N. Y.

PANTASOTE

Trade Mark

Seat and Curtain Materials

There is no substitute for Pantasote

AGASOTE

Trade Mark

Roofing—Headlining—Wainscoting

The only homogeneous panel board

*standard
for electric railway cars
and motor buses*

The PANTASOTE COMPANY Inc.

At 46th 250 Park Avenue Street
NEW YORK



Cold Dinners

for *your* passengers?

Not if you use

AJAX

BABBITT for ARMATURES

keeps the rolling stock rolling



The Ajax Metal Company

Established 1880

PHILADELPHIA

NEW YORK

CHICAGO

BOSTON

CLEVELAND

Griffin Wheel Company

410 North Michigan Ave.

Chicago, Ill.

Griffin Wheels

with

Chilled Rims

and

Chilled Back of Flanges

**For Street and Interurban
Railways**

FOUNDRIES:

Chicago
Detroit
Denver

Boston
Kansas City
Council Bluffs
Salt Lake City

St. Paul
Los Angeles
Tacoma

Next in the Line of Electric Railway Development



Laken Patented
Indoor Sprayer Tower

WITHOUT exception, every practical electric railway man who inspected the Phoenix Electric Refrigerator Car at the Cleveland Convention, expressed the deepest interest. Most of them were surprised at the simplicity of the mechanical equipment and its operation. For instance, they did not expect to find that a Phoenix car goes out on a trip without an attendant; in fact, the machinery room is locked.

Furthermore, but few expected to find any mechanical equipment that could produce such low temperatures and maintain any desired

temperature within so narrow a range.

Every problem in refrigeration has been solved by the Phoenix. It is fully reliable, trouble-free, simple and inexpensive.

The details will interest every progressive electric railway official.

Send for complete descriptive literature.

The Phoenix Ice Machine Co.
Cleveland, Ohio



R 11 Double Register

Both our latest single and double registers are now equipped for electric as well as mechanical hand or foot operation.

Full Electric Operation of Fare Registers

A completely satisfactory fare registration system is one that has the confidence of the public, the conductor and the accounting department. The simplicity and accuracy of International Registers maintained for more than thirty years, is combined in the later types with the extra speed and convenience of electric operation.

The International Register Co.
15 South Throop St., Chicago

Greater Service Per Dollar Invested



"Tiger" Bronze Axle and Armature Bearings

More-Jones "Tiger" Bronze castings for axle and armature-bearing service was one of our early achievements. This is probably the most widely known bronze on the market. It has stood the test of time. There is nothing better for long, efficient and most economical results. Let us quote you.

More-Jones Brass & Metal Co.
St. Louis, Mo.

**MORE-JONES
QUALITY PRODUCTS**



A true Safety Coach

The life of the Motor Bus you operate is dependent almost entirely on the kind of materials used, and the class of workmanship performed on it. Wherever piece work is involved—rigid inspection of materials, as well as workmanship, is absolutely necessary. P. T. L. inspects motor busses at the point of manufacture from the laying out of the frame through the various stages of assembly to the finished article.

Our Bulletin No. 28 describes this practical inspection service in detail. Write to-day.

Pittsburgh Testing Laboratory

Inspecting Engineers and Chemists

Pittsburgh

Branch Offices in the Principal Cities

Penna.

Kalamazoo Trolley Wheels

The value of Kalamazoo Trolley Wheels and Harps has been demonstrated by large and small electric railway systems for a period of thirty years. Being exclusive manufacturers, with no other lines to maintain, it is through the high quality of our product that we merit the large patronage we now enjoy. With the assurance that you pay no premium for quality we will appreciate your inquiries.



THE STAR BRASS WORKS
KALAMAZOO, MICH., U. S. A.



WE make a specialty of ELECTRIC RAILWAY LUBRICATION

We solicit a test of TULC
on your equipment

The Universal Lubricating Co.
Cleveland, Ohio

Chicago Representatives: Jameson-Rose Company,
Straus Bldg.



Use only Awebco Tape on your Armatures
Field Coils have better protection when wound with
"AWEBCO Tape." Send for samples.

ANCHOR WEBBING COMPANY
300 Brook Street, Pawtucket, Rhode Island

"POSITIONS WANTED"

is the heading under which many excellent
positions have been secured through the

"SEARCHLIGHT SECTION"

MEN! Use these columns for good jobs.

EMPLOYERS! Consult these columns for
good men.

4 cents a word. Minimum 75 cents an insertion.

0131

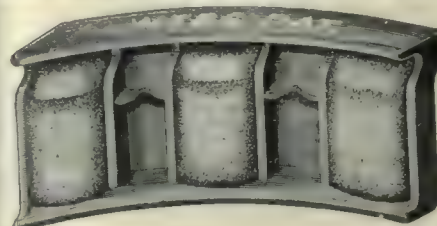


FARE BOXES for BUSES

Let us tell you of this especially de-
signed box for this class of service.

The Cleveland Fare Box Co.
4900 Lexington Ave., Cleveland, O.
Canadian Cleveland Fare Box Co., Ltd.
Preston, Ontario

COIN COUNTING And Sorting Machines CHANGES CARRIERS Tokens



Don't
Take
Cars Out
Of Service
To Turn
Worn
Wheels

THE WHEEL TRUING BRAKE SHOE does the work
while your car is in service. Don't jeopardize your
schedules by excessive pull-ins owing to wheel troubles.
Use Wheel Truing Brake Shoes and keep the maximum
equipment in service. They save time, labor and money.

WHEEL TRUING BRAKE SHOE CO.
Detroit, Mich.

THE BABCOCK & WILCOX COMPANY

85 LIBERTY STREET, NEW YORK

Builders since 1868 of
Water Tube Boilers
of continuing reliability

BRANCH OFFICES

BOSTON, 49 Federal Street
PHILADELPHIA, Packard Building
PITTSBURGH, Farmers Deposit Bank Building
CLEVELAND, Guardian Building
CHICAGO, Marquette Building
CINCINNATI, Traction Building
ATLANTA, Candler Building
PHOENIX, ARIZ., Heard Building
DALLAS, TEX., 2001 Magnolia Building
HONOLULU, H. T. Castle & Cooke Building
PORTLAND, ORE., 305 Gasco Building



WORKS
Bayonne, N. J.
Barberton, Ohio

Makers of Steam Superheaters
since 1898 and of Chain Grate
Stokers since 1893

BRANCH OFFICES

DETROIT, Ford Building
NEW ORLEANS, 344 Camp Street
HOUSTON, TEXAS, 1011-13 Electric Building
DENVER, 444 Seventeenth Street
SALT LAKE CITY, 405-6 Kearns Building
SAN FRANCISCO, Sheldon Building
LOS ANGELES, 404-6 Central Building
SEATTLE, L. C. Smith Building
HAVANA, CUBA, Calle de Aguilar 104
SAN JUAN, Porto Rico, Royal Bank Building

Lorain Special Trackwork Girder Rails

Electrically Welded Joints

THE LORAIN STEEL COMPANY

Johnstown, Pa.

Sales Offices:

Atlanta Chicago Cleveland New York
Philadelphia Pittsburgh Dallas

Pacific Coast Representative:

United States Steel Products Company
Los Angeles Portland San Francisco Seattle

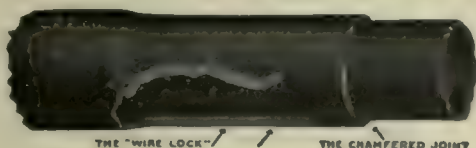
Export Representative:

United States Steel Products Company, New York, N. Y.

Tisco Manganese Steel in trackwork,
introduced by Wharton in 1894, is
still the superior metal for long life
under severest railway service.

WILLIAM WHARTON JR. & CO., Inc.
Easton, Penna.

ELRECO TUBULAR POLES



THE "WIRE LOCK" THE CHAMFERED JOINT

COMBINE

Lowest Cost Lightest Weight
Least Maintenance Greatest Adaptability

Catalog complete with engineering data sent on request.

ELECTRIC RAILWAY EQUIPMENT CO.
CINCINNATI, OHIO

New York City, 30 Church Street

B. A. HEGEMAN, Jr., President H. A. HEGEMAN, First Vice-Pres. and Treas.
F. T. SARGENT, Secretary W. C. PETERS, Vice-Pres. Sales and Engineering

National Railway Appliance Co.

Grand Central Terminal, 452 Lexington Ave., Cor. 45th St., New York

BRANCH OFFICES

Munsey Bldg., Washington, D. C. 100 Boylston St., Boston, Mass.
Hegeman-Castle Corporation, Railway Exchange Building, Chicago, Ill.

RAILWAY SUPPLIES

Tool Steel Gears and Pinions	Ft. Pitt Spring & Mfg. Co., Spring
Anglo-American Varnish Co., Varnishes, Enamels, etc.	Flaxlinum Insulation
National Hand Holds	Anderson Slack Adjusters
Genesco Paint Oils	Economy Electric Devices Co., Power Saving and Inspection Meters
Dunham Hopper Door Device	Yellow Coach Mfg. Company— Single and Double-deck Buses
Garland Ventilators	Feasible Drop Brake Stalls
Walter Tractor Snow Plows	

The DIFFERENTIAL CAR



Standard on
60 Railways for

Track Maintenance
Track Construction
Ash Disposal
Coal Hauling
Concrete Materials
Waste Handling
Excavated Materials
Hauling Cross Ties
Snow Disposal

Use These Labor Savers

Differential Crane Car
Clark Concrete Breaker
Differential Bottom Dump Ballast Car
Differential Car Wheel Truck and Tractor

THE DIFFERENTIAL STEEL CAR CO., Findlay, O.



Special Track Work of every
description

THE BUDA COMPANY
Harvey (Suburb Chicago) Illinois

Bankers and Engineers

Ford, Bacon & Davis Incorporated Engineers

115 Broadway, New York
PHILADELPHIA CHICAGO SAN FRANCISCO

The J. G. White Engineering Corporation

Engineers—Constructors

Oil Refineries and Pipe Lines, Steam and Water Power Plants, Transmission Systems, Hotels, Apartments, Office and Industrial Buildings, Railroads.

43 Exchange Place

New York

STONE & WEBSTER

Incorporated

EXAMINATIONS REPORTS APPRAISALS

ON

INDUSTRIAL AND PUBLIC SERVICE PROPERTIES

New York

Boston

Chicago

THE BEELER ORGANIZATION

ENGINEERS AND CONSULTANTS

Traction-Traffic-Equipment-Power Investigations

TRANSPORTATION, TRAFFIC, AND OPERATING SURVEYS

COORDINATING SERVICE—FINANCIAL REPORTS

APPRAISALS—MANAGEMENT

52 Vanderbilt Ave.

New York

SANDERSON & PORTER ENGINEERS

PUBLIC UTILITIES & INDUSTRIALS

Design Construction Management
Examinations Reports Valuations

CHICAGO

NEW YORK

SAN FRANCISCO

KELLY, COOKE & COMPANY ENGINEERS

Operation and Management

Traffic and Transportation Surveys

PARKWAY at SIXTEENTH ST.

PHILADELPHIA

ALBERT S. RICHEY ELECTRIC RAILWAY ENGINEER

WORCESTER, MASSACHUSETTS

REPORTS—APPRAISALS—RATES—OPERATION—SERVICE

ENGELHARDT W. HOLST

Consulting Engineer

Appraisals Reports Rates Service Investigation
Studies on Financial and Physical Rehabilitation
Reorganization Operation Management

683 Atlantic Ave., BOSTON, MASS.

Transmission Line and Special Crossing Structures, Catenary Bridges

WRITE FOR OUR NEW DESCRIPTIVE CATALOG

ARCHBOLD-BRADY CO.

Engineers and Contractors

SYRACUSE, N. Y.

DAY & ZIMMERMANN, INC. ENGINEERS

DESIGN - CONSTRUCTION - REPORTS

VALUATIONS - MANAGEMENT

NEW YORK

PHILADELPHIA

CHICAGO

STEVENS & WOOD

INCORPORATED

ENGINEERS AND CONSTRUCTORS

120 BROADWAY, NEW YORK

ENGINEERING
CONSTRUCTION

YOUNGSTOWN, O.

FINANCING
MANAGEMENT

WALTER JACKSON

Consultant on Fares and Motor Buses

The Weekly and Sunday Pass—Differential
Fares—Ride Selling

143 Crary Ave., Mt. Vernon, N. Y.

HEMPHILL & WELLS

CONSULTING ENGINEERS

Gardner F. Wells

Albert W. Hemphill

APPRAISALS

INVESTIGATIONS COVERING

Reorganization Management Operation Construction

43 Cedar Street, New York City

KELKER, DELEUW & CO.

CONSULTING ENGINEERS

REPORTS ON

Operating Problems

Valuations

Traffic Surveys

111 W. Washington Street, Chicago, Ill.

BUCHANAN & LAYNG CORPORATION

Engineering and Management, Construction,
Financial Reports, Traffic Surveys
and Equipment Maintenance

BALTIMORE
1004 Citizens National
Bank Bldg.

Phone:
Hanover: 2142

NEW YORK
49 Wall Street

McCLELLAN & JUNKERSFELD

Incorporated

ENGINEERING AND CONSTRUCTION

Examinations—Reports—Valuations

Transportation Problems—Power Developments

68 Trinity Place, New York

CHICAGO

ST. LOUIS

J. ROWLAND BIBBINS*Engineer—2301 Connecticut Ave., N.W., Washington, D. C.***TRANSPORTATION SURVEYS**

Organized Traffic Relief and Transit Development
Co-ordinating Motor Transport, Railroad and City
Plans, Service, Routing, Valuation, Economic Studies
EXPERIENCE IN 20 CITIES

A. L. DRUM & COMPANY*Consulting and Constructing Engineers*

VALUATION AND FINANCIAL REPORTS
RATE STUDIES FOR PRESENTATION TO PUBLIC SERVICE
COMMISSIONS

CONSTRUCTION AND MANAGEMENT OF
ELECTRIC RAILWAYS

230 South Clark Street, Chicago, Ill.

F. J. BRENNAN**Traffic Analyst—Schedules**

588 Park Place Brooklyn, N. Y.

THE P. EDWARD WISH SERVICE

59 Church St. NEW YORK Street Railway Inspection DETECTIVES 131 State St. BOSTON

When writing the advertiser for information or
prices, a mention of the Electric Railway
Journal would be appreciated.

A Single Segment or a Complete Commutator

is turned out with equal care in our shops. The orders we fill
differ only in magnitude; small orders command our utmost care
and skill just as do large orders. CAMEBON quality applies to
every coil or segment that we can make, as well as to every
commutator we build. That's why so many electric railway men
rely absolutely on our name.

Cameron Electrical Mfg. Co., Ansonia, Connecticut



Gets Every Fare
**PEREY TURNSTILES
or PASSIMETERS**

Use them in your Prepayment Areas and
Street Cars

Perey Manufacturing Co., Inc.
101 Park Avenue, New York City

BRAZED Rail Bonds ARC WELD
Portable Arc Welding Outfits
The Electric Railway Improvement Co.
Cleveland, Ohio

INDUSTRIAL GASES

OXYGEN
ACETYLENE



HYDROGEN
NITROGEN

Quick shipment and low prices also on cylinders, valves, torches,
regulators and supplies.

International Oxygen Co., Main Offices: Newark, N. J.
Branches: New York Pittsburgh Toledo

**ACME**

**Varnished Insulations
Electrically and
Physically Tested***

for

DIELECTRIC STRENGTH
DIELECTRIC CONSTANT
DIELECTRIC LOSS
INSULATION RESISTANCE
POWER FACTOR
FLEXIBILITY
RESISTANCE TO TEAR
TENSILE STRENGTH
EFFECT OF HEAT
RESISTANCE TO OILS
RESISTANCE TO IMPREG-
NATING COMPOUNDS

[*A. S. T. M. Tests are followed in all
Acme tests of raw materials and
finished products.]

Acme Varnished Insulations are furnished in
tape form to meet specification. Furnished
in widths of $\frac{1}{4}$ -inch and wider; and in rolls of
continuous lengths without splices up to 225
lineal yards. Special finishes furnished on
order. Write for Catalog 3-J, telling the
story of Acme Varnished Insulations.

ACME WIRE PRODUCTS

The Acme Wire Co.,

Main Office and Plant, New Haven, Conn.

New York, 52 Vanderbilt Ave. Chicago, 427 West Erie St.
Boston, 80 Federal St. Cleveland, Guardian Bldg.



Reg. U. S. Pat. Office

AMELECTRIC PRODUCTS
BARE COPPER WIRE AND CABLE
TROLLEY WIRE
WEATHERPROOF WIRE
AND CABLE
PAPER INSULATED
UNDERGROUND CABLE
MAGNET WIRE

AMERICAN ELECTRICAL WORKS
PHILLIPSDALE, R. I.

Boston, 176 Federal; Chicago, 20-22 West Randolph Street;
 Cincinnati, Traction Bldg.; New York, 100 E. 43rd St.

"The Standard for Rubber Insulation"

INSULATED WIRES and CABLES

"Okonite," "Manson," and Dundee "A" "B" Tapes

Send for Handbook

The Okonite Company

The Okonite-Callender Cable Company, Inc.

Factories, PASSAIC, N. J.

PATERSON, N. J.

Sales Offices: New York Chicago Pittsburgh St. Louis Atlanta
 Birmingham San Francisco Los Angeles Seattle

Pettingell-Andrews Co., Boston, Mass.

F. D. Lawrence Electric Co., Cincinnati, O.

Novelty Electric Co., Phila., Pa.

Own. Rep.: Engineering Materials Limited, Montreal.

Cuban Rep.: Victor G. Mandana Co., Havana.



Almco Electric Railway
Automatic
Signals

**for Accessibility
and Reliability**

EST. 1888 **Almco** INC. 1918
"American"
INSULATING
MACHINERY
COMPANY

Philadelphia, New York, Paris, England

Sales Agents:

Electric Service Supplies Co.
 Philadelphia New York Chicago

Hubbard and COMPANY

PITTSBURGH • OAKLAND, CAL. • CHICAGO



*{ The Hardware makes the line
Hubbard makes the Hardware }*

Waterproofed Trolley Cord



Is the finest cord that science and skill can produce.
 Its wearing qualities are unsurpassed.

**FOR POSITIVE SATISFACTION ORDER
SILVER LAKE**

If you are not familiar with the quality you will be
 surprised at its **ENDURANCE** and **ECONOMY**.

Sold by Net Weights and Full Lengths

SILVER LAKE COMPANY

Manufacturers of bell, signal and other cords.
Newtonville, Massachusetts

**NACHOD & UNITED STATES
SIGNAL CO., INC.**

LOUISVILLE, KY.

BLOCK SIGNALS

FOR

**ELECTRIC RAILWAYS
HIGHWAY CROSSING SIGNALS**



ANACONDA TROLLEY WIRE

ANACONDA COPPER MINING COMPANY
 THE AMERICAN BRASS COMPANY

Rods, Wire Cable Products

NEW YORK

CHICAGO

THE WORLD'S STANDARD

"IRVINGTON"

Black and Yellow
 Varnished Silk, Varnished Cambric, Varnished Paper

Irr-O-Slot Insulation Flexible Varnished Tubing
 Insulating Varnishes and Compounds

Irvington Varnish & Insulator Co.
 Irvington, N. J.

Sales Representatives in the Principal Cities

Advertisements for the Searchlight Section

Can be received at the New
 York Office of Electric
 Railway Journal
 until 10 a. m.



Wednesday

For issue out Saturday

SEARCHLIGHT SECTION

USED EQUIPMENT & NEW—BUSINESS OPPORTUNITIES

UNDISPLAYED—RATE PER WORD.

Positions Wanted, 4 cents a word, minimum 75 cents an insertion, payable in advance.

Positions Vacant and all other classifications, 8 cents a word, minimum charge \$2.00.

Proposals, 40 cents a line an insertion.

INFORMATION

Box Numbers in care of any of our offices count 10 words additional in undisplayed ads.

Discount of 10% if one payment is made in advance for four consecutive insertions of undisplayed ads (not including proposals).

DISPLAYED—RATE PER INCH

1 to 3 inches, \$4.50 an inch.

4 to 7 inches, 4.50 an inch.

8 to 14 inches, 4.10 an inch.

States for larger spaces, or yearly rates, on request.

In advertising such is measured vertically for one column, 3 columns—30 inches—40 a page.

OFFICIAL PROPOSAL

Bids: Dec. 15.

Car Advertising Space

Honolulu, Hawaii.

Sealed proposals for the leasing of car advertising space in the street cars and buses operated by the Honolulu Rapid Transit Co., Ltd., of Honolulu, Hawaii, will be received at their office, 1133 Alapai Street, Honolulu, T.H., up to 12 o'clock noon, Wednesday, Dec. 15, 1926.

Specifications as to bids may be obtained from the office of the Company, the Electric Railway Journal or Electric Traction.

The company reserves the right to reject any or all bids.

FOR SALE

14 BIRNEY SAFETY CARS

Brill Built

West. 508 or G.E. 264 Motors
Cars Complete—Low Price—Fine Condition

ELECTRIC EQUIPMENT CO.

Commonwealth Bldg., Philadelphia, Pa.

POSITIONS WANTED

OPERATING man: Capable of taking charge of transportation department of electric railway. Practical experience in each of its branches. Highest of references. PW-944, Electric Railway Journal, 7 So. Dearborn St., Chicago, Ill.

POSITION wanted as working barn foreman, single truck road preferred. Can wind armatures, do any kind of wiring and controller repairs. 12 years' experience, both single and double truck. PW-945, Electric Railway Journal, 1600 Arch St., Phila., Pa.

SUPERINTENDENT transportation; wide experience; fine record on city and interurban properties; credited with having built up one of the best groups of trainmen in Middle West and placing property on paying basis. Wishes to make connection with property in need of clean cut, progressive, capable transportation official. PW-940, Electric Railway Journal, Guardian Building, Cleveland, O.

YOUNG man wants position providing an opportunity of learning electric railway practice. Graduate of a co-operative course in electrical engineering. PW-941, Electric Railway Journal, 7 So. Dearborn St., Chicago, Ill.

Rail Switches

7-in. Girder, hard center construction.

7-in. Tee Rail.

With Mates and Frogs.

H. E. SALZBERG CO., Inc.

50 Church St., New York City

SWEEPERS

2 Brill single truck sweepers.
Fully equipped for double end operation.

IRVING S. VAN LOAN CORPORATION
1750 Broadway, New York City

Specialists in street cars or any part of a street car.

Illustrated bulletin supplied on request.

Searchlight Results:

Positions Vacant:

"The strongest proof that your Searchlight Department finds its way to many readers is shown by the numerous letters we have received in answer to our recent advertisement."

Secretary—A Connecticut Railway Co.

"You gave us one good man as a result of a similar advertisement in the Electric Railway Journal some time ago. Please give us another."

Proprietor of Steel Sales Agency.

Positions Wanted:

"The result of advertising in the Searchlight Section of your Electric Railway Journal I have secured a position with The ——— Traction Co. of W. Va."

"I received 8 replies and accepted a position with the ——— Railway Co. with over 30% increase in salary."

Business Opportunity:

"Advertisement for investment to develop or acquire Traction Light & Fr. The results from the advertisement in Electric Railway Journal have been satisfactory."

New York City Attorney.

Equipment For Sale:

"Our advertisement in the Electric Railway Journal located a buyer, and I have disposed of the car in question."

President—Buffalo Industrial Plant.

"We have disposed of all of our Girder Rails advertised in your paper. We are frank to tell you that the material went to three different traction lines and represents three separate and distinct new accounts. Our idea is that when it comes to bringing something to buyers in the traction field, there is but one sheet, and that is yours."

Dealer—New York City.

"There is no necessity for the continuation of this advertising, for the reason that we could have sold this equipment five times over from the advertisement that was run one time."

Superintendent—A Pennsylvania Railway Co.

Equipment Wanted:

"The two insertions of this advertisement which you displayed in admirable manner were sufficient to obtain for us the exact equipment that we desired."

Superintendent—A New England Railway Co.

For Every Business Want: "Think Searchlight First"

WHAT AND WHERE TO BUY

Equipment, Apparatus and Supplies Used by the Electric Railway Industry
with Names of Manufacturers and Distributors Advertising in this Issue

Advertising, Street Car
Collier, Inc., Barron G.

Air Brakes
Westinghouse Air Brake Co.
Air Receivers and After-coolers
Ingersoll-Rand Co.

Anchors, Guy
Elec. Service Supplies Co.
Ohio Brass Co.
Westinghouse E. & M. Co.

Appraisals
American Appraisal Co.

Armature Shop Tools
Elec. Service Supplies Co.

Automatic Regulators, Voltage, Current & Synchronizers
American Brown Boveri Corp.

Automatic Return Switch Stands
Ramapo Ajax Corp.

Automatic Safety Switch Stands
Ramapo Ajax Corp.

Axles
Bemis Car Truck Co.
Bethlehem Steel Co.
Brill Co., The J. G.
Cincinnati Car Co.
Johnson & Co., J. R.
National Ry. Appliances Co.
St. Louis Car Co.
Westinghouse E. & M. Co.

Axles, Carbon Vanadium
Johnson & Co., J. R.

Axles (Front and Rear) Motor Truck and Passenger Car
Timken-Detroit Axle Co.

Axles, Steel
Carnegie Steel Co.
Johnson & Co., J. R.

Axles, Trailer & Motor Bus
Timken-Detroit Axle Co.

Babbitt Metal
Ajax Metal Co.
Johnson & Co., J. R.
More-Jones Brass & Metal Co.

Badges and Buttons
Elec. Service Supplies Co.
International Register Co.

Batteries, Dry
National Carbon Co.

Bearings and Bearing Metals
Ajax Metal Co.

Bemis Car Truck Co.
Brill Co., The J. G.
General Electric Co.
More-Jones Brass & Metal Co.

Bells and Bells
Consolidated Car Heating Co.
Stucki Co., A.

Bells and Gongs
Brill Co., The J. G.
Elec. Service Supplies Co.
St. Louis Car Co.

Benders, Rail
Railway Track-work Co.

Bodies, Bus
Brill Co., The J. G.
Cummings Car & Coach Co.

Body Material, Haskellite and Plymett
Haskellite Mfg. Corp.

Boilers
Babcock & Wilcox Co.

Boiler Tubes
National Tube Co.

Bond Testers
American Steel & Wire Co.
Electric Service Supplies Co.

Bonding Apparatus
Amer. Steel & Wire Co.
Electric Railway Improvement Co.
Ohio Brass Co.
Railway Track-work Co.
Una Welding & Bonding Co.

Bonds, Rail
Amer. Steel & Wire Co.
Electric Railway Improvement Co.

Brackets and Cross Arms
(See also Poles, Ties, Posts, Etc.)

Bates Expanded Steel Truss Co.
Elec. Ry. Equipment Co.
Elec. Service Supplies Co.

Brackets and Cross Arms
(See also Poles, Ties, Posts, Etc.)

Brackets and Cross Arms
(See also Poles, Ties, Posts, Etc.)

Brake Adjusters
Brill Co., The J. G.
National Ry. Appliances Co.
Westinghouse Tr. Br. Co.

Brake Shoes
American Brake Shoe & Foundry Co.
Bemis Car Truck Co.
Brill Co., The J. G.
St. Louis Car Co.
Wheel Truing Brake Shoe Co.

Brakes, Brake Systems and Brake Parts
Bemis Car Truck Co.
Brill Co., The J. G.
General Electric Co.
National Brake Co.
Safety Car Device Co.
St. Louis Car Co.
Westinghouse Tr. Br. Co.

Brushes, Carbon
General Electric Co.
Jeandron, W. J.
Le Carbone Co.
National Carbon Co.
Westinghouse E. & M. Co.

Brushes, Graphite
National Carbon Co.

Brushes, Metal Graphite
National Carbon Co.

Brushes, Wire Pneumatic
Ingersoll-Rand Co.

Bulkheads
Haskellite Mfg. Corp.

Buses, Motor
Brill Co., The J. G.
Cummings Car Coach Co.
St. Louis Car Co.
Studebaker Corp. of America

Bushings, Case Hardened and Manganese
Brill Co., The J. G.
Bemis Car Truck Co.
St. Louis Car Co.

Cables, (See Wires and Cables)

Cambrie Tapes, Yellow and Black Varnish
Irrington Varnish & Ins. Co.

Cambrie Yellow and Black Varnish
Mica Insulator Co.

Carbon Brushes (See Brushes, Carbon)

Carbon Paste, Welding
National Carbon Co.

Carbon Plates, Welding
National Carbon Co.

Carbon Rods, Welding
National Carbon Co.

Car Lighting Fixtures
Elec. Service Supplies Co.

Car Panel Safety Switches
Consolidated Car Heat Co.
Westinghouse E. & M. Co.

Car Wheels, Rolled Steel
Bethlehem Steel Co.

Cars, Dump
Brill Co., The J. G.
Differential Steel Car Co.
Inc.

Cars, Gas-Electric
Brill Co., The J. G.
General Electric Co.
Westinghouse E. & M. Co.

Cars, Gas, Rail
Brill Co., The J. G.

Cars, Passenger, Freight, Express, etc.
Amer. Car Co.
Brill Co., The J. G.
Cincinnati Car Co.
Cummings Car & Coach Co.
Kuhlman Car Co., G. C.
National Ry. Appliances Co.
St. Louis Car Co.
Wason Mfr. Co.

Cars, Second Hand
Electric Equipment Co.

Cars, Self-Propelled
Brill Co., The J. G.
General Electric Co.

Castings, Brass Composition or Copper
Ajax Metal Co.
More-Jones Brass & Metal Co.

Castings, Gray Iron and Steel
American Steel Foundries
Bemis Car Truck Co.
St. Louis Car Co.

Castings, Malleable & Brass
Bemis Car Truck Co.
St. Louis Car Co.

Catchers and Retrievers, Trolley
Earl, C. L.
Elec. Service Supplies Co.
Ohio Brass Co.
Wood Co., Chas. N.

Catenary Construction
Archbold-Brady Co.

Ceiling Car
Haskellite Mfg. Corp.
Pantastote Co., Inc.

Ceilings, Plywood, Panels
Haskellite Mfg. Corp.

Cement
N. Amer. Cement Corp.

Cement Accelerator
N. Amer. Cement Corp.

Change Carriers
Cleveland Fare Box Co.
Electric Service Supplies Co.

Circuit-Breakers
General Electric Co.
Westinghouse E. & M. Co.

Circuit Breakers, Oil
American Brown Boveri Corp.

Clamps and Connectors for Wires and Cables
Elec. Ry. Equipment Co.
Elec. Ry. Improvement Co.
Elec. Service Supplies Co.
General Electric Co.
Hubbard & Co.
Ohio Brass Co.
Westinghouse E. & M. Co.

Cleaners and Scrapers, Track (See also Snow-Plows, Sweepers and Brooms)
Brill Co., The J. G.
Cincinnati Car Co.
Ohio Brass Co.
St. Louis Car Co.

Clusters and Sockets
General Electric Co.

Coal and Ash Handling (See Conveying and Hoisting Machinery)

Coil Banding and Winding Machines
Elec. Service Supplies Co.
Westinghouse Elec. & M. Co.

Coils, Armature and Field
General Electric Co.
Westinghouse E. & M. Co.

Coils, Choke and Kicking
Elec. Service Supplies Co.
General Electric Co.
Westinghouse E. & M. Co.

Coin Counting Machines
Cleveland Fare Box Co.
International Register Co.

Coin Sorting Machines
Cleveland Fare Box Co.

Coin Wrappers
Cleveland Fare Box Co.

Commutator Slotters
Elec. Service Supplies Co.
General Electric Co.
Westinghouse E. & M. Co.
Wood Co., Chas. N.

Commutator Truing Devices
General Electric Co.

Commutators or Parts
Cameron Electrical Mfg. Co.
General Electric Co.
Westinghouse E. & M. Co.

Compressors, Air
General Electric Co.
Ingersoll-Rand Co.
Westinghouse Tr. Br. Co.

Compressors, Air, Portable
Ingersoll-Rand Co.

Condensers
General Electric Co.
Ingersoll-Rand Co.
Westinghouse E. & M. Co.

Condenser Papers
Irrington Varnish & Ins. Co.

Connectors, Solderless
Westinghouse E. & M. Co.

Connectors, Trailer Car
Consolidated Car Heat Co.
Elec. Service Supplies Co.
Ohio Brass Co.

Controllers or Parts
General Electric Co.
Westinghouse E. & M. Co.

Controller Regulators
Elec. Service Supplies Co.

Controlling Systems
General Electric Co.
Westinghouse E. & M. Co.

Converters, Rotary
General Electric Co.
Westinghouse E. & M. Co.

Copper Wire
American Brass Co.
American Steel & Wire Co.
Anaconda Copper Mining Co.
Rome Wire Co.

Copper Wire Instruments, Measuring, Testing and Recording
American Brass Co., The
American Steel & Wire Co.
Anaconda Copper Mining Co.

Cord, Bell, Trolley, Register, etc.
American Steel & Wire Co.
Brill Co., The J. G.
Elec. Service Supplies Co.
International Register Co.
Roebbling's Sons Co., John A.
Samson Cordage Works
Silver Lake Co.

Cord Connectors and Couplers
Elec. Service Supplies Co.
Samson Cordage Works
St. Louis Car Co.
Wood Co., Chas. N.

Couplers, Car
American Steel Foundries
Brill Co., The J. G.
Cincinnati Car Co.
Ohio Brass Co.
St. Louis Car Co.
Westinghouse Tr. Br. Co.

Cranes, Hoists & Lifts
Buda Co., The
Electric Service Supplies Co.

Cross Arms (See Brackets)

Crossings
Ramapo Ajax Corp.
Wm. Wharton, Jr. & Co.

Crossing Foundations
International Steel Tie Co.

Crossings, Frog and Switch
Ramapo Ajax Corp.
Wm. Wharton, Jr. & Co.

Crossings, Mangnese
Bethlehem Steel Co.
Ramapo Ajax Corp.
Wm. Wharton, Jr. & Co.

Crossing Signals, (See Signal Systems, Highway Crossing)

Crossings, Track (See Track, Special Work)

Crossings, Trolley
Ohio Brass Co.
Westinghouse E. & M. Co.

Curtains & Curtain Fixtures
Brill Co., The J. G.
O. M. Edwards Co., Inc.
Pantastote Co., Inc.
St. Louis Car Co.

Dealer's Machinery & Second Hand Equipment
Elec. Equipment Co.
Salzberg, Inc., H. E.
Van Loan Corp., Irving S.

Derailing Switches
Ramapo Ajax Corp.

Destination Signs
Elec. Service Supplies Co.

Detective Service
Wish Service, Edward P.

Door Operating Devices
Brill Co., The J. G.
Consolidated Car Heat Co.
National Pneumatic Co.
Safety Car Devices Co.

Doors & Door Fixtures
Brill Co., The J. G.
O. M. Edwards Co., Inc.
General Electric Co.
Hale-Kilburn Co.
St. Louis Car Co.

Drills, Track
Amer. Steel & Wire Co.
Elec. Service Supplies Co.
Ingersoll-Rand Co.
Ohio Brass Co.

Dryers, Sand
Elec. Service Supplies Co.
Ohio Brass Co.
Westinghouse Elec. & Mfg. Co.

Ears
Elec. Service Supplies Co.
Ohio Brass Co.
Westinghouse E. & M. Co.

Electric Grinders
Railway Track-work Co.

Electric Refrigerator Cars
Phoenix Ice Machine Co.

Electrical Wires and Cables
Amer. Electrical Works
Amer. Steel & Wire Co.
John A. Roebbling's Sons Co.
Rome Wire Co.

Electrodes, Carbon
Railway Track-work Co.
Una Welding & Bonding Co.

Electrodes, Steel
Railway Track-work Co.
Una Welding & Bonding Co.

Engineers, Consulting, Contracting and Operating
Archbold-Brady Co.
Beeler, John A.
J. Rowland Bibbins
F. J. Brennan
Buchanan & Layng Corp.
Day & Zimmermann, Inc.
A. L. Drum & Co.
Ford, Bacon & Davis
Hemphill & Wells
Hoist, Engelhardt W.
Jackson, Walter
Kelker & DeLeuw
Kelly-Cooke Co.
McGillan & Junkersfeld
Richer, Albert S.
Sanderson & Porter
Stevens & Wood
Stone & Webster
White Eng. Corp., The J. G.

Engines, Gas, Oil and Steam
Ingersoll-Rand Co.
Westinghouse E. & M. Co.

Engines, Gasoline
Continental Motors Co.

Exterior Side Panels
Haskellite Mfg. Corp.

Fare Boxes
Cleveland Fare Box Co.
Nat'l Ry. Appliances Co.
Ohmer Fare Register Co.
Perey Mfg. Co.

Fare Registers
Elec. Service Supplies Co.
Ohmer Fare Register Co.

Fences, Woven Wire and Fence Posts
Acme Wire Co., The
Amer. Steel & Wire Co.

Fenders and Wheel Guards
Brill Co., The J. G.
Cincinnati Car Co.
Consolidated Car Fender Co.
St. Louis Car Co.
Star Brass Works
Wood Co., Chas. N.

Fibre and Fibre Tubing
Westinghouse E. & M. Co.

Field Coils (See Coils)

Flashlights
National Carbon Co.

Flaximum Insulators
National Railway Appliances Co.

Floodlights
Elec. Service Supplies Co.

Floor, Sub
Haskellite Mfg. Corp.

Fluors
Haskellite Mfg. Corp.

Forgings
Brill Co., The J. G.

Frogs & Crossings, Tee Rail
Bethlehem Steel Co.
Ramapo Ajax Corp.
Wm. Wharton, Jr. & Co.

Frogs, Track (See Track Work)

Frogs, Trolley
Elec. Service Supplies Co.
Ohio Brass Co.
Westinghouse E. & M. Co.

Furnaces, Electric
American Brown Boveri Corp.

Fuses and Fuse Boxes
Consolidated Car Heat Co.
General Electric Co.
Westinghouse E. & M. Co.

Fuses, Refillable
General Electric Co.

Gaskets
Westinghouse Tr. Br. Co.

Gas Producers
Westinghouse E. & M. Co.

Gates, Car
Brill Co., The J. G.
Cincinnati Car Co.
St. Louis Car Co.

Gauges, Oil and Water
Ohio Brass Co.

Gear Blanks
Brill Co., The J. G.

Gear Blanks
Brill Co., The J. G.

Gear Blanks
Brill Co., The J. G.

Gear Blanks
Brill Co., The J. G.

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Gear Blanks
Brill Co., The J. G.

Gear Blanks
Brill Co., The J. G.



This Silver Strand (Reg.) now marks the shunts of all National Pyramid Brushes

ON ANY brush-equipped electrical machine, look at the brush shunts. Look for the Silver Strand. It is the visible identifying mark on all National Pyramid Brushes—your guarantee of satisfactory brush performance.

All shunts of National Pyramid Brushes now bear this Silver Strand as an identifying mark, visible to the most casual glance. The familiar letters NCC, the three pyramids and the grade number will still be found on the brush itself for your guidance in purchasing

and installing. When the brush is in service, the Silver Strand in the shunt is a visual sign to all that here is a National Pyramid Brush, supremely suited for the work for which it is designed.

Thousands of brushes are now in use bearing this shunt, which has the same conductivity as the former unmarked shunts. The Silver Strand is a mark that indicates, but does not affect, the perfection of performance you have learned to expect from National Pyramid Brushes. Look for the Silver Strand.

National Pyramid Brushes

Manufactured and guaranteed by

NATIONAL CARBON COMPANY, INC.

Carbon Sales Division

Cleveland, Ohio

San Francisco, Cal.

Canadian National Carbon Co., Limited, Toronto, Ontario

Emergency Service Plants

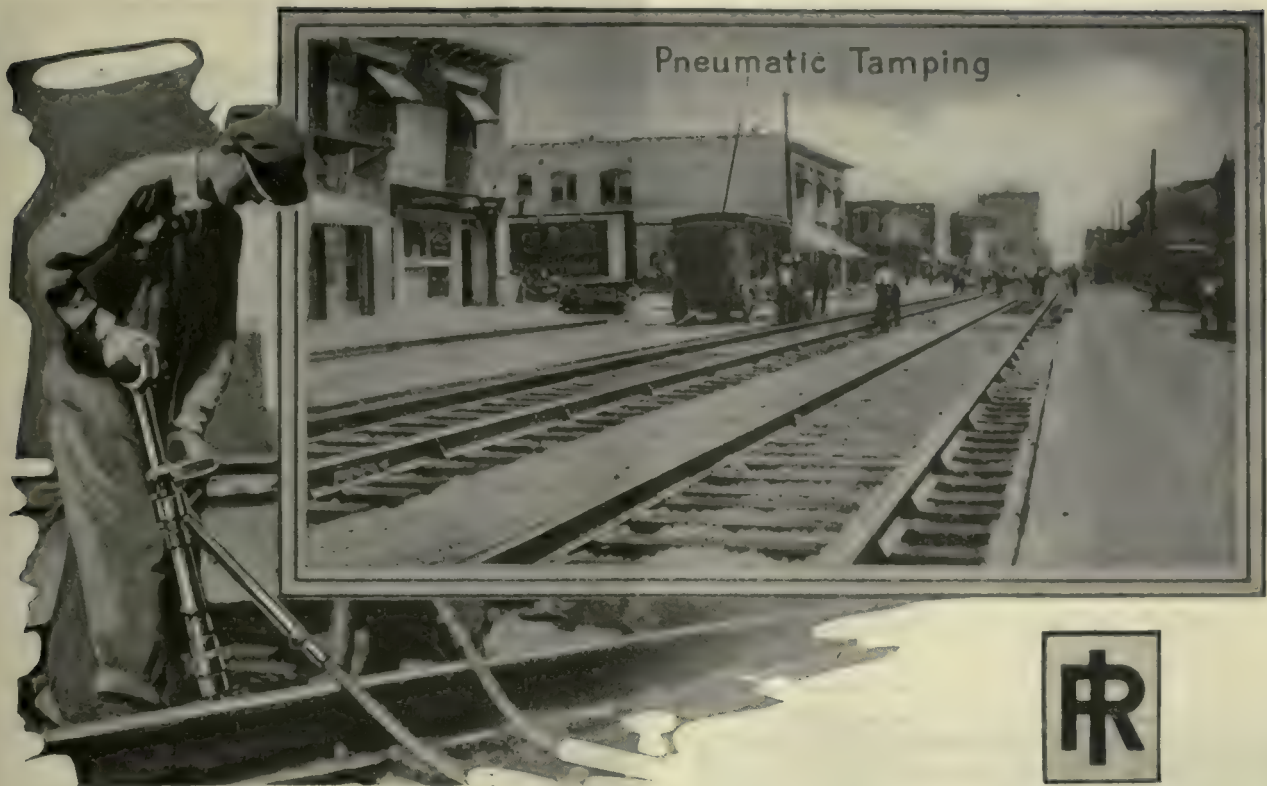
CHICAGO, ILL.
551 West Monroe St.
Phone: State 6092

PITTSBURGH, PA.
7th Floor, Arrott Power Bldg. No. 3, Barker Place
Phone: Atlantic 3570

NEW YORK, N. Y.
357 West 36th St.
Phone: Lackawanna 8153

BIRMINGHAM, ALA.
1824 Ninth Ave., N.
Phone: Main 4016

- Gear Cases**
Chillingworth Mfg. Co.
Elec. Service Supplies Co.
Westinghouse E. & M. Co.
- Gears and Pinions**
Bemis Car Truck Co.
Elec. Service Supplies Co.
General Electric Co.
Nat'l Ry. Appliance Co.
Nuttall Co., R. D.
Tool Steel Gear & Pinion Co.
- Generating Sets, Gas-Electric**
General Electric Co.
- Generators**
American Brown Boveri Corp.
General Electric Co.
Westinghouse E. & M. Co.
- Girders**
Bethlehem Steel Co.
Lorain Steel Co.
- Gongs (See Bells and Gongs)**
- Greases (See Lubricants)**
- Grinders & Grinding Supplies**
Metal & Thermit Corp.
Railway Track-work Co.
- Grinders, Portable**
Railway Track-work Co.
- Grinders, Portable Electric**
Railway Track-work Co.
- Grinding Bricks and Wheels**
Railway Track-work Co.
- Guard Rail Clamps**
Ramapo Ajax Corp.
- Guard Rails, Tee Rail & Manganese**
Ramapo Ajax Corp.
Wm. Wharton, Jr. & Co.
- Guards, Trolley**
Elec. Service Supplies Co.
Ohio Brass Co.
- Hammers, Pneumatic**
Ingersoll-Rand Co.
- Harps, Trolley**
Elec. Service Supplies Co.
More-Jones Brass & Metal Co.
Nuttall Co., R. D.
Star Brass Works
- Headlights**
Elec. Service Supplies Co.
General Electric Co.
Ohio Brass Co.
St. Louis Car Co.
- Headlining**
Haskelite Mfg. Corp.
Pantasote Co., Inc.
- Heaters, Car (Electric)**
Consolidated Car Heat. Co.
Gold Car Heat. & Ltg. Co.
Nat'l Ry. Appliance Co.
Smith Heater Co., Peter
- Heaters, Car, Hot Air and Water**
Smith Heater Co., Peter
- Heaters, Car, Stove**
Smith Heater Co., Peter
- Helmets, Welding**
Railway Track-work Co.
Una Welding & Bonding Co.
- Hoists, Portable**
Ingersoll-Rand Co.
- Hose, Bridges**
Ohio Brass Co.
- Hose, Pneumatic**
Westinghouse Trac. Br. Co.
- Inspecting Engineers & Chemists**
Pittsburgh Testing Laboratory
- Instruments, Measuring, Testing and Recording**
American Steel & Wire Co.
General Electric Co.
Westinghouse E. & M. Co.
- Insulating Cloth, Paper and Tape**
Anchor Webbing Co.
General Electric Co.
Irvington Varnish & Ins. Co.
Mica Insulator Co.
Okonite Co.
Okonite-Callender Cable Co. Inc.
U. S. Rubber Co.
Westinghouse E. & M. Co.
- Insulating Machinery**
Amer. Ins. Machinery Co.
- Insulating Silk**
Irvington Varnish & Ins. Co.
- Insulating Varnishes**
Irvington Varnish and Insulating Co.
- Insulation (See also Paints)**
Electric Ry. Equipment Co.
Elec. Service Supplies Co.
General Electric Co.
Irvington Varnish & Ins. Co.
Mica Insulator Co.
Okonite-Callender Cable Co. Inc.
U. S. Rubber Co.
Westinghouse E. & M. Co.
- Insulation Slot**
Irvington Varnish & Ins. Co.
- Insulator Pins**
Elec. Service Supplies Co.
Hubbard & Co.
- Insulators (See also Line Materials)**
Electric Ry. Equipment Co.
Elec. Service Supplies Co.
General Electric Co.
Irvington Varnish & Ins. Co.
Ohio Brass Co.
Westinghouse E. & M. Co.
- Interior Side Linings**
Haskelite Mfg. Corp.
- Interurban Cars (See Cars, Passenger, Freight, Express, etc.)**
Cummings Car & Coach Co.
- Jacks (See also Hoists and Lifts)**
Buda Co., The
Elec. Service Supplies Co.
National Ry. Appliance Co.
- Journal Boxes**
Bemis Car Truck Co.
Brill Co., The J. G.
St. Louis Car Co.
- Lamps, Guards and Fixtures**
Elec. Service Supplies Co.
General Electric Co.
Westinghouse E. & M. Co.
- Lamps, Arc & Incandescent (See also Headlights)**
General Electric Co.
Westinghouse E. & M. Co.
- Lamps, Signal and Marker**
Elec. Service Supplies Co.
Ohio Brass Co.
- Leather**
Cleveland Tanning Co.
- Letter Boards**
Haskelite Mfg. Corp.
- Lightning Protection**
Elec. Service Supplies Co.
General Electric Co.
Ohio Brass Co.
Westinghouse E. & M. Co.
- Line Material (See also Brackets, Insulators, Wires, etc.)**
Archbold-Brady Co.
Electric Ry. Equipment Co.
Elec. Service Supplies Co.
General Electric Co.
Hubbard & Co.
More-Jones Brass & Metal Co.
Ohio Brass Co.
Westinghouse E. & M. Co.
- Locking Spring Boxes**
Wm. Wharton, Jr. & Co.
- Locomotives, Diesel, Electric**
American Brown Boveri Corp.
- Locomotives, Electric**
American Brown Boveri Corp.
Cummings Car & Coach Co.
General Electric Co.
St. Louis Car Co.
Westinghouse E. & M. Co.
- Locomotives, Oil Engine, Electric, Diesel**
Ingersoll-Rand Co.
- Lubricating Engineers**
Texas Company
Universal Lubricating Co.
- Lubricants, Oil and Grease**
Texas Company
Universal Lubricating Co.
- Lumber (See Poles, Ties, etc.)**
- Machinery, Insulating**
American Insulating Machinery Co.
- Manganese Parts**
Bemis Car Truck Co.
- Manganese Steel Guard Rails**
Ramapo Ajax Corp.
Wm. Wharton, Jr. & Co.
- Manganese Steel, Special Track Work**
Bethlehem Steel Co.
Wm. Wharton, Jr. & Co.
- Manganese Steel Switches, Frogs & Crossings**
Bethlehem Steel Co.
Ramapo Ajax Corp.
Wm. Wharton, Jr. & Co.
- Mica**
Mica Insulator Co.
- Motor and Generator Sets**
General Electric Co.
- Motor Buses (See Buses, Motor)**
- Motor Generator Sets**
American Brown Boveri Corp.
- Motorman's Seats**
Brill Co., The J. G.
Elec. Service Supplies Co.
St. Louis Car Co.
Wood Co., Chas. N.
- Motors, Electric**
General Electric Co.
Westinghouse E. & M. Co.
- Nuts and Bolts**
Bemis Car Truck Co.
Hubbard & Co.
- Oils (See Lubricants)**
- Oxygen**
International Oxygen Co.
- Packing**
U. S. Rubber Co.
Westinghouse Tr. Brake Co.
- Paints and Varnishes (Insulating)**
Dixon Crucible Co., Joseph
Electric Service Supplies Co.
Irvington Varnish & Ins. Co.
- Paints and Varnishes for Woodwork**
National Ry. Appliance Co.
- Panels, Outside, Inside**
Haskelite Mfg. Corp.
- Pavement Breakers**
Ingersoll-Rand Co.
- Pickups, Trolley Wire**
Elec. Service Supplies Co.
Ohio Brass Co.
- Pinion Pullers**
Elec. Service Supplies Co.
General Electric Co.
Wood Co., Chas. N.
- Pinions (See Gears)**
- Pins, Case Hardened, Wood and Iron**
Bemis Car Truck Co.
Ohio Brass Co.
Westinghouse Tr. Brake Co.
- Pipe**
National Tube Co.
- Pipe Fittings**
Westinghouse Tr. Brake Co.
- Planers (See Machine Tools)**
- Plates for Tee Rail Switches**
Ramapo Ajax Corp.
- Pliers, Rubber Insulated**
Elec. Service Sup. Co.
Nat'l Ry. Appliance Co.
- Plywood, Roofs, Headlinings, Floors, Interior Panels, Bulkheads, Truss Planks**
Haskelite Mfg. Corp.
- Pneumatic Tools**
Ingersoll-Rand Co.
- Pole Line Hardware**
Bethlehem Steel Co.
Elec. Service Supplies Co.
Ohio Brass Co.
- Pole Reinforcing**
Hubbard & Co.
- Poles and Ties Treated**
Bell Lumber Co.
International Croscoting Co.
- Poles, Metal Street**
Bates Expanded Steel Truss Co.
Elec. Ry. Equipment Co.
Hubbard & Co.
- Poles, Ties, Posts, Piling & Lumber**
Bell Lumber Co.
International Croscoting Co.
Naugle Pole & Tie Co.
- Poles, Trolley**
Bell Lumber Co.
Elec. Service Supplies Co.
National Tube Co.
Nuttall Co., R. D.
- Poles, Tubular Steel**
Elec. Ry. Equipment Co.
Elec. Service Supplies Co.
National Tube Co.
- Portable Grinders**
Buda Co., The
- Roofs**
Okonite Co.
Okonite-Callender Cable Co. Inc.
- Power Saving Devices**
National Ry. Appliance Co.
- Pressure Regulators**
General Electric Co.
Ohio Brass Co.
Westinghouse E. & M. Co.
Westinghouse Tr. Brake Co.
- Pumps**
A. S. Cameron Steam Pumps (Ingersoll-Rand Co.)
Ingersoll-Rand (A. S. Cameron Steam Pumps)
- Pumps, Vacuum**
A. S. Cameron Steam Pumps (Ingersoll-Rand Co.)
Ingersoll-Rand (A. S. Cameron Steam Pumps)
- Punches, Ticket**
International Register Co.
Wood Co., Chas. N.
- Rail Braces & Fastenings**
Ramapo Ajax Corp.
- Rail Grinders (See Grinders)**
- Rail Joints**
Carnegie Steel Co.
- Rail Joints—Welded**
Lorain Steel Co.
Metal & Thermit Corp.
- Rail Welding**
Metal & Thermit Corp.
Railway Track-work Co.
Una Welding & Bonding Co.
- Rails, Relaying**
L. B. Foster Co.
- Rails, Steel**
Carnegie Steel Co.
Electric Equipment Co.
L. B. Foster Co.
- Railway Safety Switches**
Consolidated Car Heat. Co.
Westinghouse E. & M. Co.
- Railway Welding (See Welding Processes)**
- Rattans**
Brill Co., The J. G.
Cummings Car & Coach Co.
Elec. Service Supplies Co.
Hale-Kilburn Co.
St. Louis Car Co.
- Rectifiers, Mercury Arc**
Power
American Brown Boveri Corp.
- Refrigerator Cars, Electric**
Phoenix Ice Machine Co.
- Registers and Fittings**
Brill Co., The J. G.
Cincinnati Car Co.
Elec. Service Supplies Co.
International Register Co.
Ohmer Fare Register Co.
St. Louis Car Co.
- Reinforcement, Concrete**
Amer. Steel & Wire Co.
Bethlehem Steel Co.
Carnegie Steel Co.
- Repair Shop Appliances (See also Coil Banding and Winding Machines)**
Elec. Service Supplies Co.
- Repair Work (See also Coils)**
General Electric Co.
Westinghouse E. & M. Co.
- Replacers, Car**
Elec. Service Sup. Co.
- Resistance, Wire and Tube**
General Electric Co.
Westinghouse E. & M. Co.
- Resistances**
Consolidated Car Heat. Co.
- Retrievers, Trolley (See Catchers and Retrievers, Trolley)**
- Rivets**
General Electric Co.
Westinghouse E. & M. Co.
- Roofing, Car**
Haskelite Mfg. Corp.
Pantasote Co., Inc.
- Roofs, Car and Bus**
Haskelite Mfg. Corp.
- Rubber Specialties of all kinds**
U. S. Rubber Co.
- Safety Control Devices**
Safety Car Devices Co.
- Sanders, Track**
Brill Co., The J. G.
Elec. Service Supplies Co.
Ohio Brass Co.
St. Louis Car Co.
- Sash Fixtures, Car**
Brill Co., The J. G.
O. M. Edwards Co., Inc.
St. Louis Car Co.
- Sash Metal Car Window**
Hale-Kilburn Co.
O. M. Edwards Co., Inc.
- Scrapers, Track (See Cleaners and Scrapers, Track)**
- Screw Drivers, Rubber Insulated**
Elec. Service Supplies Co.
- Seating Materials**
Brill Co., The J. G.
Haskelite Mfg. Corp.
Pantasote Co., Inc., The
St. Louis Car Co.
- Seats, Bus**
Brill Co., The J. G.
Hale-Kilburn Co.
St. Louis Car Co.
- Seats, Car (See also Rattans)**
Brill Co., The J. G.
Hale-Kilburn Co.
St. Louis Car Co.
- Second Hand Equipment**
Electric Equipment Co.
Salzberg, Inc., H. E.
Van Loan Corp., Irving S.
- Shades, Vestibule**
Brill Co., The J. G.
- Shovels**
Brill Co., The J. G.
Hubbard & Co.
- Shovels, Power**
Brill Co., The J. G.
- Signals, Car Starting**
Consolidated Car Heating Co.
Elec. Service Supplies Co.
National Pneumatic Co.
- Signal Systems, Block**
Elec. Service Supplies Co.
Nachod and U. S. Signal Co., Inc.
Union Switch & Signal Co.
Wood Co., Chas. N.
- Signal Systems, Highway Crossing**
Nachod and U. S. Signal Co., Inc.
Wood Co., Chas. N.
- Slack Adjusters (See Brake Adjusters)**
- Sleet Wheels and Cutters**
Elec. Ry. Equipment Co.
Elec. Ry. Improvement Co.
Elec. Service Supplies Co.
More-Jones Brass & Metal Co.
Nuttall Co., R. D.
- Snow-Plows, Sweepers and Brooms**
Brill Co., The J. G.
Consolidated Car Fender Co.
Cummings Car & Coach Co.
St. Louis Car Co.
- Soldering and Brazing (See Welding Processes and Apparatus)**
- Special Adhesive Papers**
Irvington Varnish & Ins. Co.
- Special Trackwork**
Bethlehem Steel Co.
Lorain Steel Co., The
Wm. Wharton, Jr. & Co.
- Spikes**
Amer. Steel & Wire Co.
- Splicing Compounds**
U. S. Rubber Co.
Westinghouse E. & M. Co.
- Splicing Sleeves (See Clamps and Connectors)**
- Springs, Car and Truck**
American Steel Foundries
American Steel & Wire Co.
Bemis Car Truck Co.
Brill Co., The J. G.
St. Louis Car Co.
- Sprinklers, Track and Road**
Brill Co., The J. G.
Cummings Car & Coach Co.
St. Louis Car Co.
- Steel and Steel Products**
Carnegie Steel Co.
- Steps, Car**
Brill Co., The J. G.
- Stokers, Mechanical**
Babcock & Wilcox Co.
Westinghouse E. & M. Co.
- Storage Batteries (See Batteries, Storage)**
- Strain, Insulators**
Electric Service Supplies Co.
Ohio Brass Co.
Westinghouse E. & M. Co.
- Strand**
American Steel & Wire Co.
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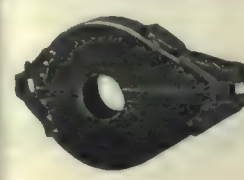


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ALPHABETICAL INDEX TO ADVERTISEMENTS

A	Page		Page		Page		Page
Acme Wire Co., The.....	57	Differential Steel Car Co., The..	55	K		Roebbling's Sons Co., John A....	64
Ajax Metal Co., The.....	52	Drum & Co., A. L.....	57	Kelker, DeLeuw & Co.....	56	Rome Wire Co.....	30
American Appraisal Co., The..	22			Kelly, Cooke & Co.....	56		
American Brass Co., The.....	58	E		Kulhman Car Co.....	67		
American Brown Boveri Elec.		Earl, C. I.....	52				
Corp.....	14-15	Edwards Co., O. M.....	29	L			
American Car Co.....	67	Electric Equipment Co.....	59	Le Carbons Co.....	50	St. Louis Car Co.....	39
American Electrical Works.....	58	Electric Ry. Equipment Co.....	55	Lorain Steel Co.....	55	Safety Car Devices.....	10
American Insulating Machinery		Electric Ry. Improvement Co..	57			Sulzbarg Inc., H. E.....	59
Co.....	58	Electric Service Supplies Co....	9			Samson Cordage Co.....	64
American Steel & Wire Co.....	44			M		Sanderson & Porter.....	56
American Steel Foundries.....	8	F		McClellan & Junkersfeld.....	56	Searchlight Section.....	59
Anaconda Copper Mining Co....	58	Firestone Tire & Rubber Co....	26	Metal & Thermit Corp.....	18-19	Silver Lake Co.....	58
Anchor Webbing Co.....	54	Ford, Bacon & Davis.....	56	Mica Insulator Co.....	50	Smith Heater Co., Peter.....	64
Archbold-Brady Co.....	56	Foster & Co., L. B.....	48	More-Jones Brass & Metal Co..	53	Star Brass Works.....	54
Asso. of Mfrs. of Chilled Car		"For Sale" Ads.....	59	Motor Wheel Corp.....	Front Cover	Stevens & Wood, Inc.....	50
Wheels.....	49					Stone & Webster.....	56
				N		Stucki Co., A.....	64
B				Nachod and United States Signal		Studebaker Corp. of America,	
Babcock & Wilcox Co.....	55	G		Co., Inc.....	58	The.....	23
Bates Expanded Steel Truss Co.	41	General Electric Co., 20, Back over		National Carbon Co.....	61	T	
Beeler Organization.....	56	Gold Car Heating & Ltg. Co....	64	National Brake Co.....	21	Texas Company, The.....	46
Bell Lumber Co.....	64	Griffin Wheel Co.....	52	National Pneumatic Co.....	13	Timken Detroit Axle Co., The..	37
Bemis Car Truck Co.....	36			National Ry. Appliance Co.....	55	Tool Steel Gear & Pinion Co.,	
Bethlehem Steel Company.....	47	H		National Tube Co.....	42	The.....	40
Bibbins, J. Rowland.....	57	Hale-Kilburn Co.....	31	Naugle Pole & Tie Co.....	64		
Brennan, F. J.....	57	Haskelite Mfg. Co.....	35	Nuttall Co., R. D.....	50	U	
Brill Co., The J. G.....	67	"Help Wanted" Ads.....	59			Una Welding & Bonding Co....	64
Buchanan & Layng Corp.....	56	Hemphill & Wells.....	56	O		Union Switch & Signal Co.....	16
Buda Co., The.....	55	Holst, Englehard W.....	56	Ohio Brass Co.....	5	Universal Lubricating Co.....	54
		Hubbard & Co.....	58	Ohmer Fare Register Co.....	38		
C				Okonite-Callender Cable Co., Inc.,		V	
Cameron Electrical Mfg. Co....	57	I		The.....	58	Van Loan Corp., Irving S.....	59
Carnegie Steel Co.....	45	India Tire & Rubber Co.....	28	Okonite Co., The.....	58		
Chillingworth Mfg. Co.....	64	Ingersoll-Rand Co.....	63			W	
Cincinnati Car Co.....	32-33	International Creosoting & Constr.		P		"Want" Ads.....	59
Cleveland Fare Box Co.....	54	Co.....	43	Pantasote Co., Inc.....	52	Wason Mfg. Co.....	67
Cleveland Tanning Co., The....	34	International Oxygen Co.....	57	Perey Mfg. Co., Inc.....	57	Westinghouse Elec. & Mfg. Co., 2, 4	
Collier, Inc., Barron G.....	51	International Register Co.....	53	Phoenix Ice Machine Co., The..	53	Westinghouse Traction Brake Co.	17
Consolidated Car Fender Co.....	64	International Steel Tie Co., The.	7	Pittsburgh Testing Laboratory..	54	Wharton, Wm., Jr. & Co., Inc.	55
Consolidated Car Heating Co.....	64	Irrington Varnish & Insulator		Positions Wanted and Vacant..	59	"What and Where to Buy,"	
Continental Motors Corp'n.....	66	Co.....	58			60, 62, 65	
Cummings Car & Coach Co.....	37	J		R		Wheel Truing Brake Shoe Co....	54
		Jackson, Walter.....	56	Railway Track-work Co.....	6	White Co., The.....	24-25
Day & Zimmermann, Inc.....	56	Jendron, W. J.....	50	Railway Utility Co.....	64	White Eng. Corp., The J. G.....	56
Dayton Mechanical Tie Co., The		Johnson & Co., Inc., J. R.....	64	Ramapo Ajax Co.....	64	Wish Service, The P. Edw.....	57
Insert 11-12				Richey, Albert S.....	56	Wood Co., Chas. N.....	64

WHAT AND WHERE TO BUY

(Continued from page 62)

Ticket Choppers and Destroyers Elec. Service Supplies Co. Ties and Tie Rods. Steel Carnegie Steel Co. International Steel Tie Co. Ties, Mechanical Dayton Mechanical Tie Co. Ties, Wood Cross (See Poles, Ties, Posts, etc.) Tires Firestone Tire & Rubber Co. India Tire & Rubber Co. Tongue Switches Wm. Wharton, Jr. & Co. Tools, Track & Miscellaneous Amer. Steel & Wire Co. Elec. Service Supplies Co. Hubbard & Co. Railway Track-work Co. Towers and Transmission Structures Archbold-Brady Co. Bates Expanded Steel Truss Co. Westinghouse E. & M. Co. Track Grinders Metal & Thermit Corp. Railway Track-work Co. Ramapo Ajax Corp. Track, Special Work Buda Co., The Ramapo Ajax Corp. Trackless Trolleys Brill Co., The J. G. St. Louis Car Co. Transfer Issuing Machines Ohmer Fare Register Co. Transformers American Brown Boveri Corp. General Electric Co. Westinghouse E. & M. Co.	Tree Wire Okonite Callender Cable Co. Okonite Co. Trolley Bases General Electric Co. More-Jones Brass & Metal Co. National Ry. Appliance Co. Nuttall Co., E. D. Ohio Brass Co. Trolley Bases, Retrieving General Electric Co. Nat'l Ry. Appliance Co. Nuttall Co., E. D. Ohio Brass Co. Trolley Buses Brill Co., The J. G. General Electric Co. Westinghouse E. & M. Co. Trolley Material, Overhead Elec. Service Supplies Co. More-Jones Brass & Metal Co. Ohio Brass Co. Westinghouse E. & M. Co. Trolley Wheels (See Wheels, Trolley) Trolley Wheel Bushings More-Jones Brass & Metal Co. Star Brass Works Trolley Wheels & Harps Elec. Service Supplies Co. More-Jones Brass & Metal Co. Star Brass Works Trolley Wire American Brass Co. Amer. Electrical Works Amer. Steel & Wire Co. Anaconda Copper Min. Co. Roebbling's Sons Co., J. A. Rome Wire Co. Trucks, Car Bemis Car Truck Co. Brill Co., The J. G. Cincinnati Car Co.	Cummings Car & Coach Co. St. Louis Car Co. Trucks, Motor White Co. Truss Planks Haskelite Mfg. Corp. Tubing, Steel National Tube Co. Tubing, Yellow & Black Flexible Varnishes Irrington Varnish & Ins. Co. Turbines, Steam American Brown Boveri Corp. General Electric Co. Westinghouse E. & M. Co. Turnstiles Elec. Service Supplies Co. Perey Mfg. Co., Inc. Turntables Elec. Service Supplies Co. Valves Ohio Brass Co. Westinghouse Tr. Br. Co. Varnished Papers & Silks Irrington Varnish & Ins. Co. Varnishes (See Paints, etc) Ventilators, Car Brill Co., The J. G. Cincinnati Car Co. Consolidated Car Heating Co. Nat'l Ry. Appliance Co. Railway Utility Co. St. Louis Car Co. Vestibule Linings Haskelite Mfg. Corp. Welded Rail Joints Electric Railway Improvement Co. Lorain Steel Co.	Metal & Thermit Corp. Ohio Brass Co. Railway Trackwork Co. Una Welding & Bonding Co. Welders, Portable Electric Electric Railway Improvement Co. Ohio Brass Co. Railway Track-work Co. Una Welding & Bonding Co. Westinghouse E. & M. Co. Welders, Rail Joint Ohio Brass Co. Railway Track-work Co. Welding Processes and Apparatus Electric Railway Improvement Co. General Electric Co. Metal & Thermit Corp. Nat'l Ry. Appliance Co. Ohio Brass Co. Railway Track-work Co. Una Welding & Bonding Co. Westinghouse E. & M. Co. Welding Steel Electric Railway Improvement Co. Railway Track-work Co. Una Welding & Bonding Co. Welding Wire American Steel & Wire Co. General Electric Co. Railway Track-work Co. Roebbling's Sons Co., J. A. Welding Wire and Rods Railway Track-work Co. Welding & Cutting Tools International Oxygen Co. Wheels, Car, Cast Iron Association of Mfrs. of Chilled Car Wheels Griffin Wheel Co. Wheels, Car, Steel & Steel Tired American Steel Foundries	Bemis Car Truck Co. Carnegie Steel Co. Wheel Guards (See Fenders and Wheel Guards) Wheel Grinders Wheel Truing Brake Shoe Co. Wheel Presses (See Machine Tools) Wheels, Motor Motor Wheel Corp. Co. Wheels, Trolley Elec. Ry. Equipment Co. Elec. Service Supplies Co. General Electric Co. More-Jones Brass & Metal Nuttall Co., E. D. Star Brass Works Wheels, Wrought Steel Carnegie Steel Co. Whistles, Air General Electric Co. Ohio Brass Co. Westinghouse E. & M. Co. Westinghouse Traction Brake Co. Wire Rope American Steel & Wire Co. Roebbling's Sons Co., J. A. Wires and Cables Acme Wire Co., The American Brass Co., The Amer. Electrical Works Amer. Steel & Wire Co. Anaconda Copper Min. Co. General Electric Co. Okonite Co. Okonite-Callender Cable Co., Inc. Roebbling's Sons Co., J. A. Rome Wire Co. Westinghouse E. & M. Co.
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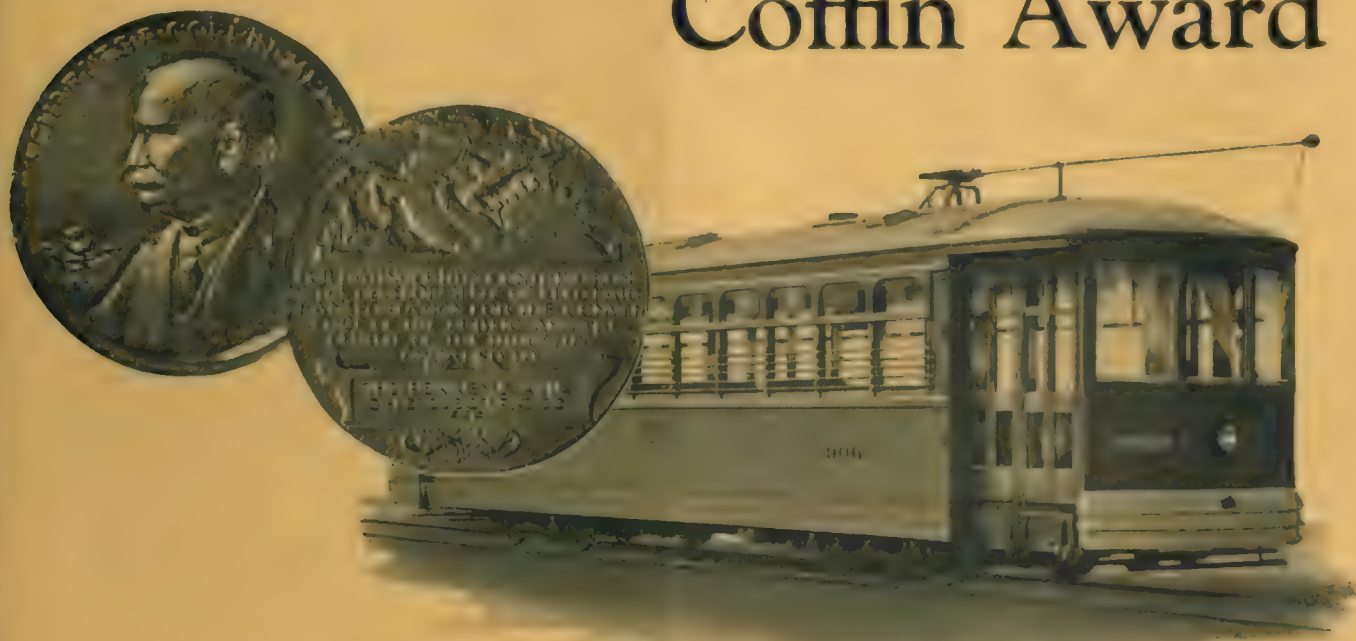
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By contributing in so substantial a measure to the development of the internal combustion engine, Continental has built up a bulwark of public confidence in Red Seal Motors.

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Continental Motors

Pennsylvania-Ohio Wins Coffin Award



Modern city cars, Youngstown Municipal Railway, built by Kuhlman, operated by Pennsylvania-Ohio Electric Co


Modernization an important factor in successful company's program

The Pennsylvania-Ohio Electric Company, winner of the 1926 Coffin Award, apparently fully appreciates the economic advantages of modern types of rolling stock. Not only have they enjoyed a 41 per cent return on capital invested in inter-urban equipment, but the new

Youngstown city cars also were designed and equipped in keeping with the higher standard of appearance and comfort upon which the American public is now living. Attractive and comfortable equipment increase passenger revenue.

The J. G. Brill Company
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New  Modern
Cars

American Car Company
St. Louis

The G. C. Kuhlman Car Co.
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Wason Mfg. Company
Springfield, Mass.



Newly purchased 80-ton, G-E Locomotive, swivel-truck type, equipped with four GE-69 Motors and Type M control.



In service 25 years— still doing a full day's work

Early in 1901 two 50-ton G-E Electric Locomotives started to work for the St. Louis & Belleville Electric Railway Company.

The service has been exceptionally severe, yet these locomotives, with their original GE-55 Motors and Type L3 controllers, still make their daily run. Repairs have been slight—a new CP-30 Compressor, new trolley bases, and lightning arresters. And of special significance is the fact that maintenance costs for each locomotive have averaged only \$1180.00 per year for the past 16 years.



In spite of the long period of service, these two G-E Locomotives will continue in operation assisted by the new 80-ton locomotive recently delivered. Records such as this have earned for G-E locomotives their reputation for dependability.

Rapidly increasing traffic made another locomotive necessary. Naturally it was purchased from General Electric because of the trouble-free service its predecessors had given.

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GENERAL ELECTRIC COMPANY, SCHENECTADY, N. Y., SALES OFFICES IN PRINCIPAL CITIES

ELECTRIC RAILWAY JOURNAL



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UNITED STATES
ROYAL CORD
Motorcoach

MADE BY THE UNITED STATES RUBBER COMPANY





MEN

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Men—your men—are fundamentally cheerful and friendly. External conditions make them grouchy. Some—not all—of these conditions you control.

The personality of an exceptional man may attract patronage to down-at-the-heel cars. Such a man is a treasure, rarely found.

But the average man is spontaneously cheerful and courteous when he works for an up-and-coming line—when the car he runs is a source of pride to him—clean, modern and comfortable.

And that is one of the reasons for the wonderful success of the modern cars equipped with Westinghouse Motors and Control.

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Vol. 63
No. 20

CONTENTS

Page
871-912

NOVEMBER 13, 1926

Editorials871

Indiana Service Corporations New Cars Have

Many de Luxe Features874

Two parlor chair buffet cars have five motor coaches with same general type of construction and ultra-comfortable seats. Low-voltage lighting unaffected by varying line voltage. Easy riding trucks and latest Pullman car conveniences.

Pick Up and Delivery Express Proves Profitable879

Illinois Traction System has established complete service using 22 Ford 1-ton truck chassis with special bodies, uniformed drivers and regular passenger facilities.

Grumbling Sells No Transportation.....881

By C. S. CHING.

Better results will be obtained by telling the public the story of accomplishments than by talking about difficulties.

Dressing Up an Old Car.....883

Softer seats, cabinets for apparatus, rubber tiling on floor and better lighting have improved appearance and increased comfort.

Motorists Warned of Near-By Car Line.....884

Encouraging Suggestions from Employees

in Baltimore884

Live Railway Exhibit in Rochester Industrial

Show884

Improved Facilities and Intensive Merchandising

Build Profitable Freight Business.....885

Illinois Traction System increases freight earnings from \$1,624,000 in 1924 to \$2,200,000 in 1926. The road handles carload and less than carload traffic from coast to coast. Has traffic agreements with 1,600 railroads and boat lines.

Transportation a Vital Factor in City Growth.....889

By M. JAYOT.

The vital relation of transportation to city growth is proved by the experience of different cities, especially Paris. The author also shows the effect of the construction of transportation systems on land values and points out the need for careful consideration of transportation questions.

North Shore Uses New Equipment for

Dispatch Freight892

Car Heater to Utilize Motor Rheostat Losses.....892

Operator's Name Carried on Fare Box.....893

Track Shift Relieves Traffic Congestion.....893

Maintenance Notes894

Association News and Discussion897

News of the Industry900

Recent Bus Developments.....904

Financial and Corporate.....906

Personal Mention909

Manufactures and the Markets.....911

Prosperity

CONTINUED prosperity in the United States is no accident, according to speakers at the Associated Business Papers convention in New York this week. It is the result of careful planning and use of ever-improved methods of production and distribution. In this connection it was shown that the business paper, dealing with the specific problems of a trade or an industry, has been one of the most constructive forces in leading the way to such improvement. The business paper has not been content to tell of accomplishments that are completed, but has shown the way to greater and greater achievement.

For years this has been the guiding principle of ELECTRIC RAILWAY JOURNAL—inspiration to better things. And only by putting inspiration such as it gives into concrete form will the industry it serves continue to enjoy prosperity.

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Making each passenger his own brakeman!



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Each passenger boarding a car adds more weight to be controlled by the brakes.

If the ordinary air brake equipment is used, this additional weight will result in a longer stopping distance than when the car was empty—particularly if the car is of the modern light weight type. The longer stop reduces the schedule speed and slows up transportation service for the passenger.

If Westinghouse Variable Load Brakes are used, however, the weight added by each passenger entering the car does not remain uncontrolled, but is used to automatically adjust the brake mechanism so that a corresponding increase in retarding force is made to assure the same stopping distance as before his extra weight was added. Each passenger thus unknowingly helps to safeguard and expedite his journey.

This modern brake for modern cars makes for safer and faster transportation, because uniformly short stopping distances are assured by virtue of automatic adjustment of brake cylinder pressure as the passenger load changes.

WESTINGHOUSE TRACTION BRAKE CO.
General Office and Works, WILMERDING, PA.

WESTINGHOUSE TRACTION BRAKES

A Resistance Welder Of New and Better Design

Ample capacity, flexibility of control and a rigid arc-welded steel frame

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Insulation has been developed to such a degree that shorts and grounds are virtually impossible. And its special refractory porcelain insulators withstand the rapid changes in temperature without harm. In addition, the welder affords exceptional rapidity of heat dissipation. These properties, together with the strength of a rigidly braced, arc-welded steel frame, give you the maximum in possible service.

Use this portable machine for welding rail bonds, building up cupped joints, and for miscellaneous shop work. See how quickly it pays for itself, not once, but many times.

Write for Folder 50B which gives complete details.

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Niagara Falls, Canada

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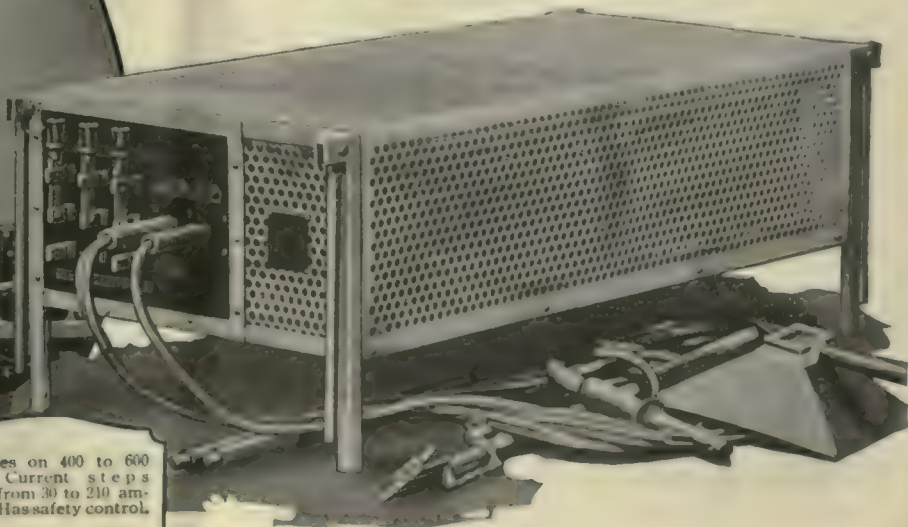


Pressed steel frames support the insulators.



Interchangeable resistance element units are readily accessible for inspection.

Operates on 400 to 600 volts. Current steps range from 30 to 210 amperes. Has safety control.



Would you try to row a boat with one oar?

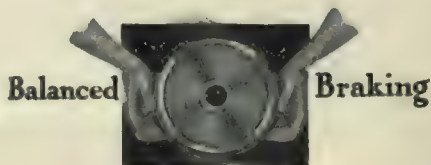
It can be done, but the inefficiency of steering against the turning effect of the one-sided force is obvious.

Similarly, balanced braking (the double shoe clasp type) is vastly superior to the single brake shoe rigging. The heavy braking load is equally balanced on opposite sides of the wheel. There is no shifting of the journal box bearing; no unbalanced load on truck frames and truck springs; less brake shoe wear; less journal box wear; fewer hot boxes; fewer slid-flat wheels; smoother and shorter stops; less train resistance in starting.

In other words, dozens of advantages—all making for economy and better transportation service.



AMERICAN MULTIPLE-UNIT
CLASP BRAKES

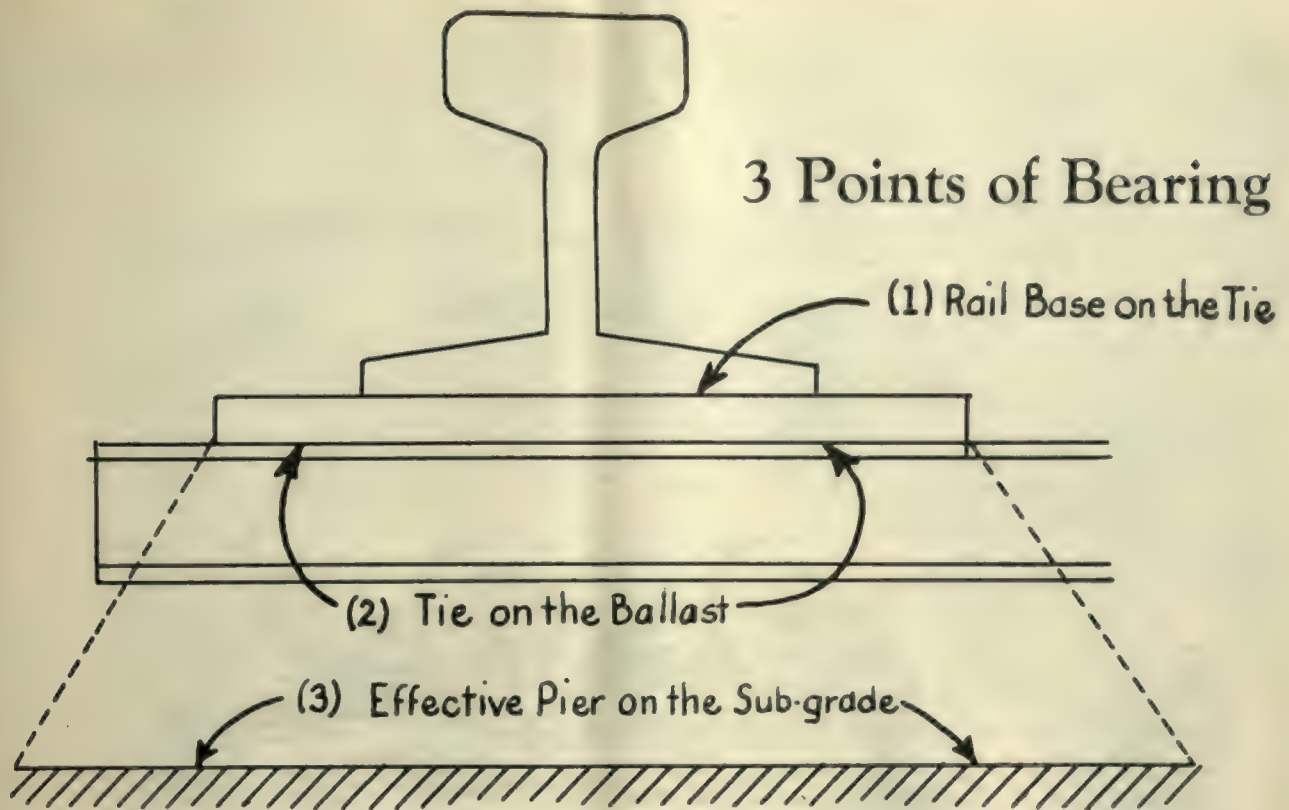


AMERICAN STEEL FOUNDRIES

NEW YORK

CHICAGO

ST. LOUIS



Check These Three Bearing Points

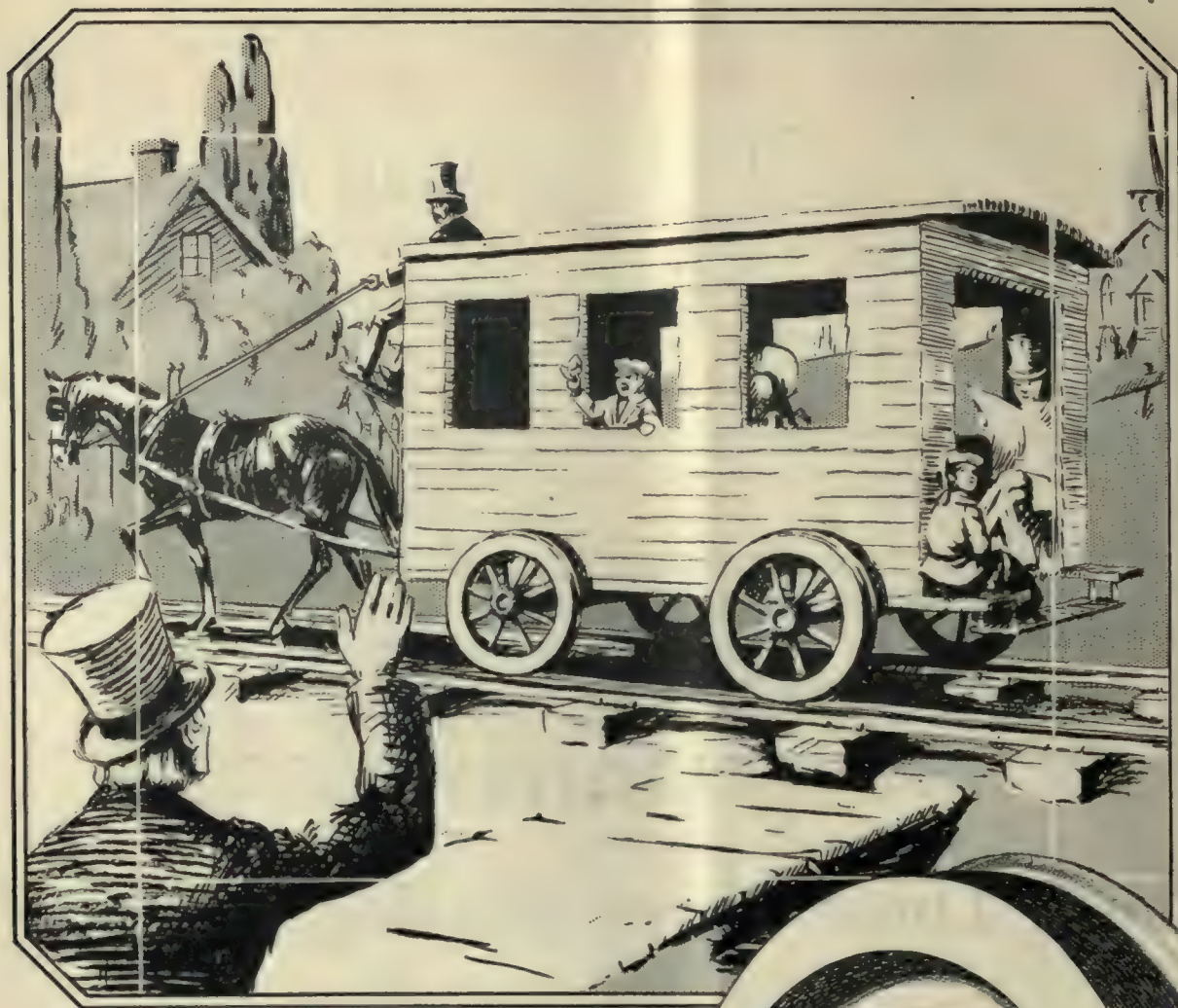
STEEL Twin Ties are well known for their large effective bearing, a feature of their efficient design and the secret of the long life, low initial cost and success of this construction. Notice and use for comparison the actual figures of Twin Tie Bearing in the table on the right.

Twin Ties on 6'0" Centers	Square Inches
(1) Rail Base on Tie (assumed 6" base)	216 50% Rail Base Supported
(2) Tie on the Ballast	936
(3) Effective Pier on the Subgrade	2700

The International Steel Tie Company
Cleveland

Write today for catalog, detailed
cost figures from many installations and
delivered price on Twin Ties.

Steel Twin Tie Track



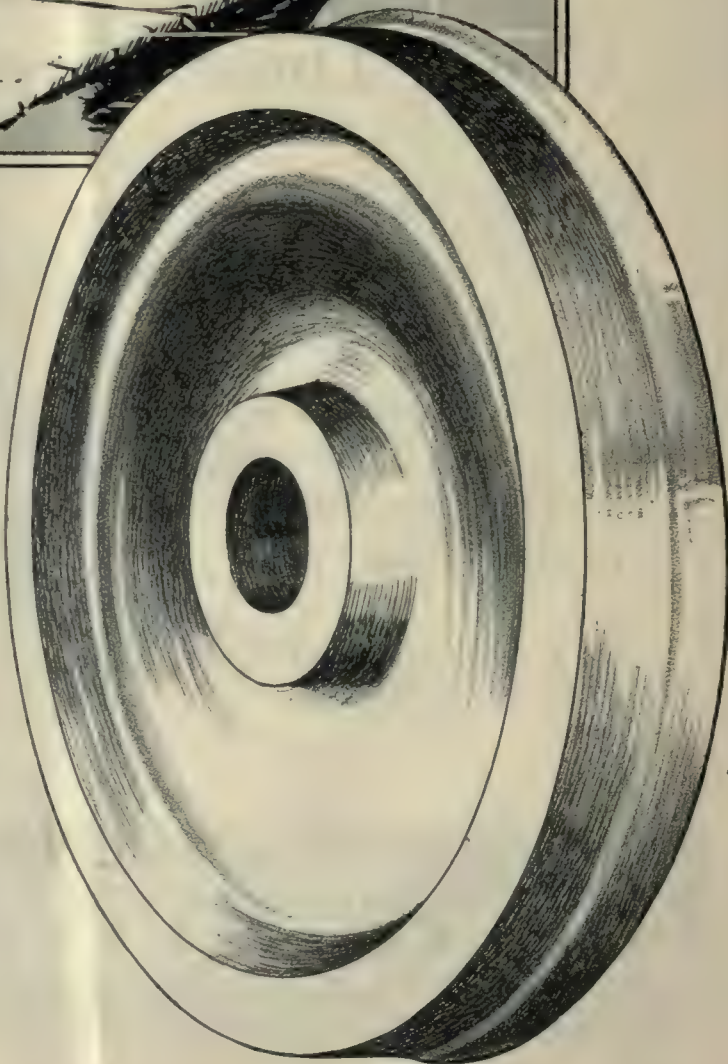
Yes, Traffic Conditions Have Changed


Heavy traffic, more congested streets, greater loads, more acute peak periods, more frequent starting, more sudden stopping—all spell the need for safe, dependable equipment—

..... which is simply another way of saying Gary Wrought Steel Wheels.

Illinois Steel Company

208 South La Salle Street
Chicago, Illinois





**GOLDEN GLOW
HEADLIGHTS**
for CARS for BUSES

*for safety
in night operation*

GOLDEN GLOW HEADLIGHTS



For electric
railway cars



For buses

Make night operation safe in all kinds of weather by use of proper headlights—Golden Glow Headlights. The intense but non-dazzling beams, made possible by the special glass reflector, penetrate rain, snow and mist better than a white, brilliant light. Dangerous grade crossings, other vehicles, obstructions on the track or road are quickly spotted by an operator behind a Golden Glow Headlight.

Send for complete particulars of the various styles and sizes of Golden Glow Headlights for both cars and buses.



ELECTRIC SERVICE SUPPLIES CO.

PHILADELPHIA
17th and Cambria Sts.
PITTSBURGH
1123 Bessemer Building

NEW YORK
50 Church St.
BOSTON
88 Broad St.
SCRANTON
316 N. Washington Ave.
Lyman Tube & Supply Co., Ltd., Montreal, Toronto, Vancouver

CHICAGO
Illinois Merchants' Bank Bldg.
DETROIT
General Motors Bldg.



They buy—and buy Again!

Repeat orders from street railway operators for Graham Brothers 21-passenger street car type Motor Coach increase steadily.

Convincing proof that the field for the medium capacity motor coach is broadening.

Convincing proof, too, that Graham Brothers Motor Coaches best fit railway operators' needs.

Attractive, dependable, comfortable—they win patronage. Low initial cost and low operating and maintenance expense make this patronage profitable.

Dodge Brothers Dealer will give you any information about Graham Brothers Motor Coaches.

21-Passenger
Street Car Type

\$3815

12-Passenger
Parlor Coach

\$3750

f. o. b. Detroit

GRAHAM BROTHERS MOTOR COACHES

SOLD BY DODGE BROTHERS DEALERS EVERYWHERE

Ask about the other fellow

When the National Pneumatic Automatic Treadle Door was new, some operators thought that it might inconvenience passengers or slow up service. Others thought it wouldn't work in ice and snow. Today, however, operators in a half a hundred cities *know* that automatic treadle operation for their exit doors is practical from every standpoint. If you, in turn, have any doubts upon the subject, ask us for list of treadle installations.



NATIONAL PNEUMATIC COMPANY

Executive Office, 50 Church Street, New York

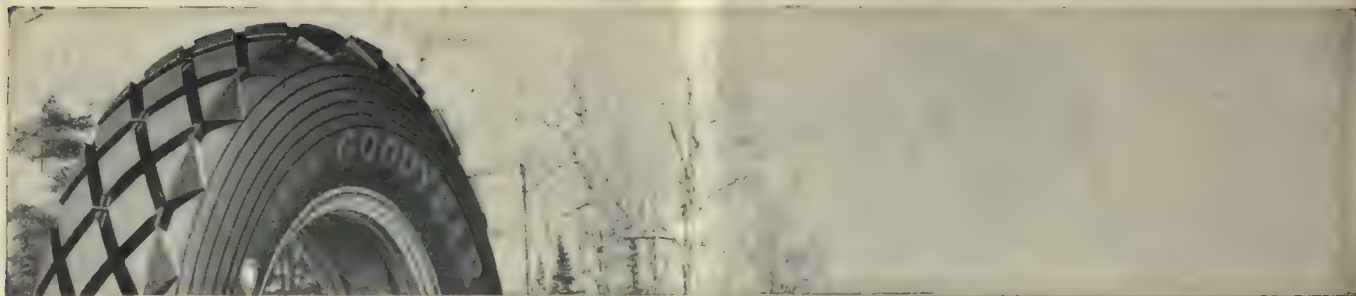
General Works, Rahway, New Jersey

CHICAGO
518 McCormick Building

MANUFACTURED IN
TORONTO, CANADA, BY
Railway & Power Engineering Corp., Ltd.

PHILADELPHIA
1010 Colonial Trust Building





What SUPERTWIST Adds to Goodyear Tires



One of the Northland Transportation Company's Goodyear-equipped buses; insert of Goodyear Pneumatic Bus Tire

You know what rugged strength and long life have always been built into Goodyear Pneumatic Bus tires.

Now you may confidently expect even greater service from Goodyears in motorbus service, because Goodyear Pneumatic Bus Tires are now made with SUPERTWIST.

SUPERTWIST is the extra elastic, extra enduring new material specially developed by Goodyear for Goodyear balloon tires, motorbus and heavy duty cord tires.

It far outstretches ordinary cotton cord, and has a maximum flexing power that yields under impact, protecting the tire from rupture, stone bruise and other in-

juries. It thus insures virtually *double* the carcass life of the tire.

Other exclusive features of the Goodyear Pneumatic Tire construction for motorbus service are (1) the new Goodyear band-building method; (2) the new Goodyear breaker; (3) the new Goodyear bead—patent applied for, and (4) the famous All-Weather Tread.

These advantages you get only in Goodyear Pneumatic Bus Tires—the only motorbus tires made of SUPERTWIST.

They are real advantages, because they result in the utmost durability, tractive power, road safety, riding comfort and long, trouble-free mileage at low cost.

Goodyear Means Good Wear

GOODYEAR

Copyright 1926, by The Goodyear Tire & Rubber Co., Inc.

BALANCED DESIGN

The essential difference
between mere rolling stock
and revenue building modern cars—

Ever since the early days the electric railway car has been an "assembled" product.

But now that old time "trolley car" rolling stock must give way to revenue-building, passenger-attractive modern cars, a new standard of car building has become necessary.

Logically such equipment can be built most efficiently and with the best chance of success, when both design and construction are brought together under one thoroughly experienced and progressive control.

This is the Cincinnati Principle of BALANCED DESIGN. The car is built as a complete unit for a specific use. While it does not mean standardization in equipment or minor details, it *does* assure a car accurately balanced in all its components, and with major characteristics of definitely known value.

Above all it means *passenger preferred transportation* rather than mere rolling stock.

We will gladly discuss this subject in detail with interested railway executives.

THE CINCINNATI CAR COMPANY
CINCINNATI, OHIO

CINCINNATI
New
CARS

A step ahead of the modern trend

Graybar
Lamps and Lighting
Graybar
ELECTRIC COMPANY
SUCCESSOR TO
SUPPLY DEPT
Western Electric

The Graybar quality tag—under which 60,000 electrical supplies are shipped.

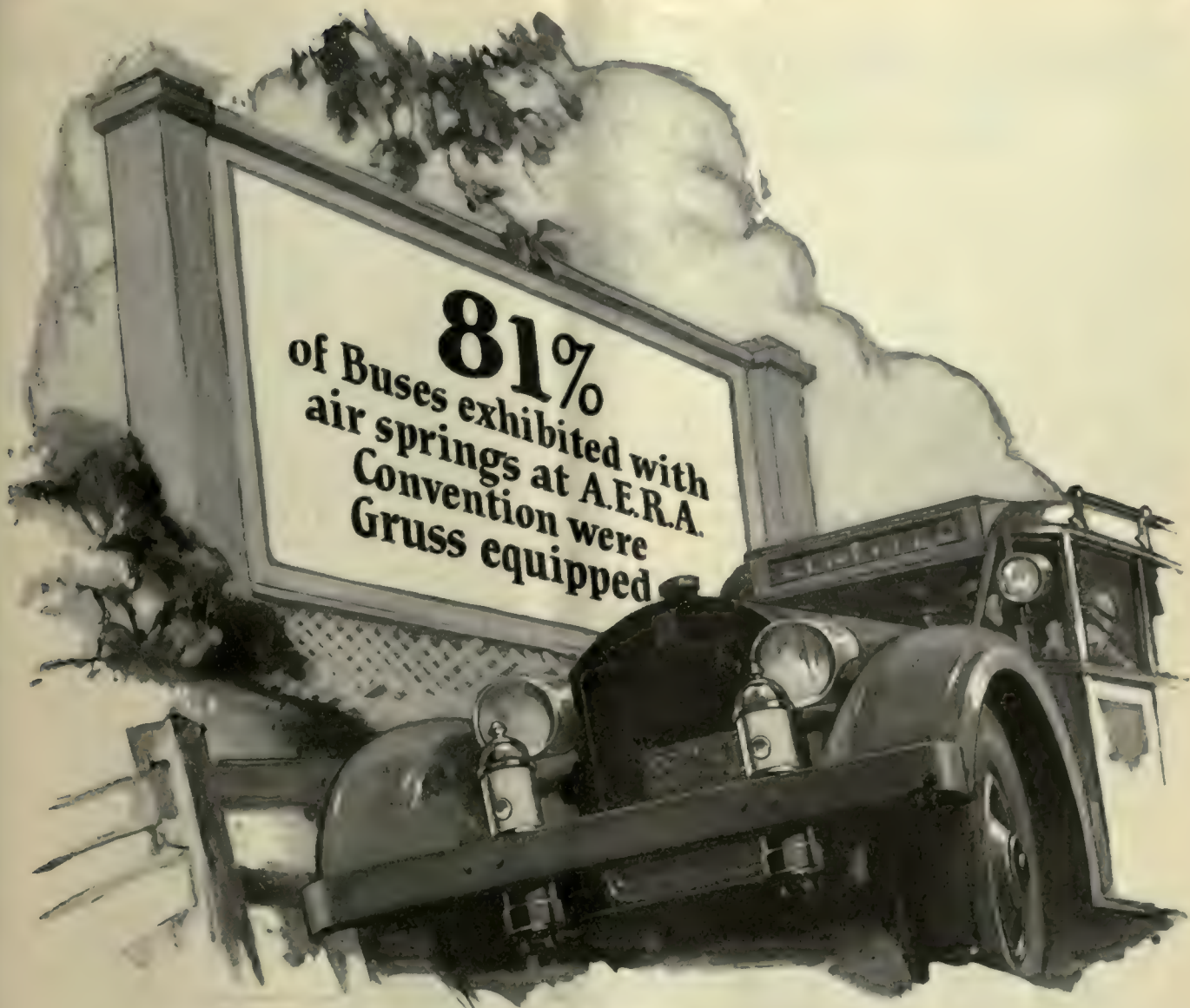
The Light in the Window

A beacon in the night, a signal of safety and welcome. For the engineer, his home seems all the cozier and more homelike for the clear soft light of its Sunbeam MAZDA Lamps. And his swaying cab seems the steadier for the steadiness of these very same lamps.

For MAZDA Lamps, for efficient lighting

units,—in short for everything electrical that a railroad needs, look to Graybar as the logical source for quality supplies.

The tag above identifies more than 60,000 electrical products distributed the country over by Graybar Electric—successor to Western Electric Supply Department in name and in a half century's experience.



THE overwhelming popularity of Gruss Air Springs was again demonstrated at the A.E.R.A. Convention. Twenty-six buses equipped with air springs were exhibited. Twenty-one of these were Gruss equipped.


Such a demonstration proves these two facts:

1. Air springs are a vital factor in cutting maintenance costs and increasing patronage because of supreme riding comfort.
2. Gruss Air Springs, because of their superiority of design, cost less for maintenance and give longer and more satisfactory service than any other type.

The CLEVELAND PNEUMATIC TOOL CO., Cleveland, Ohio

GRUSS AIR SPRINGS

*for Trucks, Buses
Passenger Cars ~*



An average of fifty to fifty-five thousand miles per tire

Mandan, N. Dak.,
Jan. 19, 1926.

Kelly-Springfield Tire Co.,
Fargo, N. Dak.

Gentlemen:

I have used numerous other makes of tires on my bus running between Mandan and Bismarck and at last started using Kelly-Springfield Cords. Although I was using a 7-inch tire previous to starting with Kellys, I am now using 6-inch tires in their stead and have been receiving an average mileage of fifty to fifty-five thousand miles per tire.

John Ellington



KELLY ^{HEAVY} DUTY CORD



These five White Busses, operated by the Pennsylvania-Ohio Electric Company, have each traveled in excess of 200,000 miles

Coffin Award again goes to users of White Trucks and Busses

The Pennsylvania-Ohio Electric Company, operating 110 White Trucks and Busses, and a pioneer in co-ordinating electric railway with bus service, has been declared winner of the Coffin Prize for 1926.

The Prize was instituted four years ago by the American Electric Railway Association. It is awarded annually to the electric railway which, in the opinion of the association, has made "the most distinguished contribution

to the development of electric transportation for the convenience of the public and benefit of the industry."

And it is a significant fact that, of the four winners of this coveted prize, three are users of White Trucks and Busses.

Previous winners, The Chicago North Shore and Milwaukee R. R. Company and The Northern Texas Traction Company and this year's winner, all operate White Busses and Trucks on a large scale.

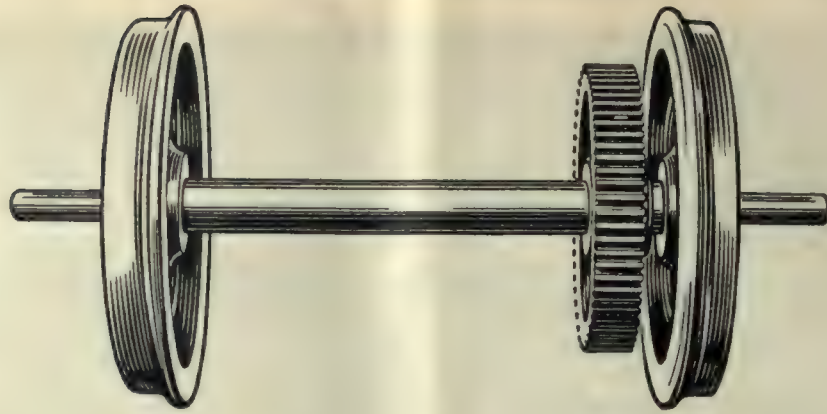


*Ask for Specifications, The New White
Six Cylinder 100 H. P. Motor Bus*

THE WHITE COMPANY - CLEVELAND

WHITE BUSES

FOURS AND SIXES



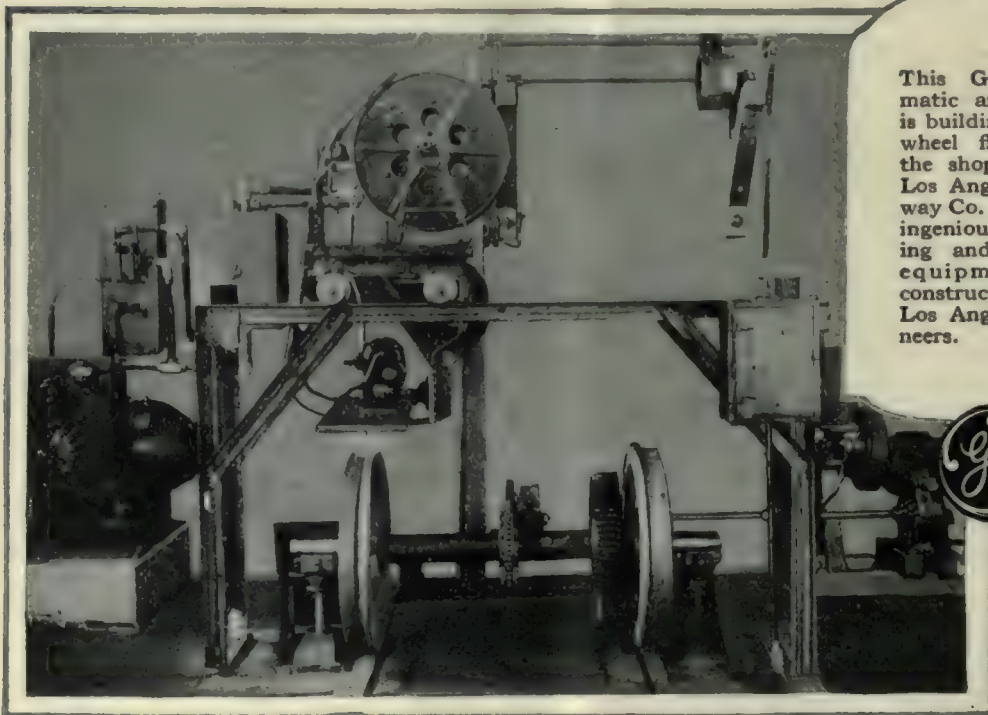
Down or Up ?

ARE you machining your worn car wheel flanges down—wasting material and time—or are you building them up—saving material and time—with a G-E automatic arc welder?

Here are some of the electric railways using G-E automatic arc welders to reclaim their worn car wheels:

Los Angeles Railway
Springfield (Mass.) Street Railways
Worcester Consolidated Railways
Detroit Municipal Railways
Kansas City Railways
Denver Tramway Co.
Northern Texas Traction Co.

In each case, the railways report that the job is being done with a speed, economy, and high quality of work unequalled by any other method yet attempted.



This G-E automatic arc welder is building up car wheel flanges in the shops of the Los Angeles Railway Co. The very ingenious mounting and driving equipment was constructed by the Los Angeles engineers.



GENERAL ELECTRIC

GENERAL ELECTRIC COMPANY, SCHENECTADY, N. Y., SALES OFFICES IN ALL PRINCIPAL CITIES

Electric Railway Journal

Consolidation of Street Railway Journal and Electric Railway Review

Published by McGraw-Hill Publishing Company, Inc.

CHARLES GORDON, Editor

Volume 68

New York, Saturday, November 13, 1926

Number 20

"Pack Up Your Troubles"

if You Want to Win Public Favor

MR. AVERAGE CITIZEN is totally uninterested in the troubles of the electric railways. Granting that the industry has received a lot of unfair treatment, there's no good to be obtained by grumbling over it now. Face forward and set about improving the service. Forget excuses and tell the public the noteworthy things that are being accomplished. Such, in substance, was the advice given to members of the Metropolitan Section, A.E.R.A., at its meeting last week.

How this policy has worked to the advantage of the steam railroads was pointed out by C. S. Ching. Some time ago these carriers stopped looking for public sympathy and began to talk service. In public esteem they stand higher today than they have stood for a long while. Electric railways would do well to follow this example. Carrying the argument a step further, another speaker explained why interruptions to service, equipment failures, etc., constitute news for the press, while reliability of service and regularity of performance do not make news. To offset this the railway must definitely undertake to keep the public informed of its progress and accomplishments.

Those who were not fortunate enough to be at the meeting will find food for thought in the abstracts of these two talks, published elsewhere in this issue. Every railway man who attended this inspiring meeting left with a concrete idea that he could take home and use in his daily work.

New York Merchants

Would Conserve Transportation Lines

RECOGNITION of the principle that existing transportation systems should be expanded to meet the increasing needs of the community is the feature of a report by the committee on city transit of the New York Merchants' Association, and which has been adopted by its board of directors. This action resulted from the recent recommendation of the city's Board of Transportation to grant new city-wide bus franchises. It is significant that this body of merchants, with neither political bias nor a brief for any particular transportation system, sees that the report "disregards the principle of unification and economic utilization of existing means of transportation and fails to consider the property rights of companies now operating." True, motor bus franchises are deemed important, but the committee did not believe that the granting of new city-wide franchise was essential or desirable.

Unlike many other reports made by merchants' associations, in this one reference has been made to the best information available. "All disinterested studies which have been made," says the committee, "show that it is not practicable to replace surface lines in New York City by bus routes in any wholesale fashion. On the

contrary, a sufficient number of buses to carry all existing traffic would generally lead to hopeless congestion of the streets."

Again, the committee holds that one of the present difficulties with transportation in New York City is adherence to the flat 5-cent fare. Competing bus lines would still further deplete the earnings of the surface lines and make the situation more difficult. Moreover, the move is of doubtful legality. But the existing systems should be encouraged to develop such motor bus lines within their territories as will extend and fill out their service. Any other method, it is held, will merely lead to increased cost and further complication, which would inevitably postpone the solution of New York's transit problem.

All of this is sound doctrine. It is applicable not only to New York but to every city where similar questions have arisen. When the business men and citizens generally appreciate their needs and foster the logical growth of the existing systems the problems of transportation will be much simplified. This is something for all railway men to ponder.

Trolley Bargain Day Again Comes to Town

WHEN good business and good will are tied together the result is a prize package. Residents of Toledo and Atlanta have recently been the recipients of these prize packages by virtue of a contract entered into by a merchandise house and the local railway company. Under the plan promulgated the store executives take a lease of the railway lines for certain hours on certain days; at the same time they extend an invitation to the public to ride free and purchase bargains in commemoration of anniversary sales. The crowds rush to the bargain counters via the railway cars, and speculation arises as to the benefits of the "trolley bargain day" revival in so far as the railway is concerned.

At the outset one is prone to see merely a day's increased receipts resulting from an increase in riding. True, the concomitant of business astuteness is financial gain, but that is only a small and relatively unimportant part of the picture. An intensive study, however, reveals a tendency of more far-reaching importance than the immediate acquisition of extra cash. The scheme binds the trolley still closer to the intimate affairs of every-day life—the trolley becomes the connecting link between man and the necessary habit of shopping.

And what pursuit transcends shopping in importance? To all women and to some men shopping is not a detestable duty, but rather a delectable diversion. Even the most unobservant salesgirl will testify to the meticulous concern and fastidious taste of the average buyer. Newspapers and magazines allot considerable space to giving advice to the prospective shopper and to enumerating the qualifications of the successful shopper.

In fact, the ideal shopper is in as enviable a position today as the perfect lover.

This important phase of every-day living presupposes transportation to the business districts and, as far as the great majority is concerned, by means of the electric railway cars. Thus, when a merchandising stunt includes trolley transport its promoters are proclaiming the trolley way as the ideal way. They are not only identifying the trolley car with every-day life but are also affirming its increasing usefulness in man's chase for the amenities of existence.

The railway bargain day idea will certainly grow. Perhaps in many localities some such campaign is awaited to awaken either a lethargic people to the serviceability of the railway utility or to win back a vacillating patronage that sees no progress unless in change, even applied to transportation. The prize packages may go to the bargain hunters, but somehow they redound to the glory of their promoters.

Transportation Is Very Closely Related to City Growth

PUBLIC opinion in this country does not usually recognize the close relation of local transportation to city development and growth. One reason may be that electric railways and other means of local transport suffer from the "triteness of long familiarity." Nevertheless, unless there is some method of conveying persons or merchandise to and from any given locality, real estate there would be almost valueless for community uses.

This is strikingly shown by the article by M. Jayot of Paris in this issue. It has a most unusual form of treatment, because of its wealth of data on transportation and its effect on city growth from various cities in Europe and South America. In it the author shows that until the beginning of local public carrier transportation, less than 100 years ago, the largest cities of the world were very different in social and community life from what they are today. So long as the cab and the private carriage were the only means of transportation, the great mass of city dwellers were forced to work, take their pleasures and do their purchasing within easy walking distances. There were no shopping or commercial districts, as these terms are now understood, in the cities of a century ago, and the largest of them contained but a few hundred thousand inhabitants.

Local transportation created not only the modern city; it created modern land values, because it enabled thousands of people to do business at a spot previously accessible only to scores.

M. Jayot's article would be of little value, except from a historical point of view, if it did not teach certain lessons and so help to solve some of the problems with which cities are now confronted. One of these, and probably the most important, is the need in any city-planning project of placing the question of public transportation at the head of the list of problems to be solved. This is true whether the portion of the city being considered is undeveloped territory or already solidly built up. Too often in the past transportation has been put far down on the list in connection with new developments and it has been disregarded almost entirely in the case of sections already developed.

A second question raised by the author relates to the economic side of public carrier development. If local transportation lines have such a vital influence on city

development and land values, should not the public control and direct their expansion, even possibly subsidize their service where it would otherwise be unremunerative, because of the great public benefits they produce? An affirmative answer to the first of these questions and even to the second could be given without indorsing municipal operation. In fact, most American cities in a sense do follow the plan of the public direction of expansion when they require certificates of convenience and necessity before the construction of a railway or bus line, and the largest cities go even farther in this direction through their city planning commissions and boards of transportation.

As to the second question, American practice as yet hardly goes to the extent of subsidies, unless some of the special rapid transit contracts, like those in New York and Boston, can be placed in this category. In fact, we in this country have gone rather to the other extreme by placing heavy tax burdens, like the paving tax and park taxes, on street railway undertakings. A person can be opposed to government subsidies for private enterprise yet still believe that electric railway lines should be very lightly taxed instead of being one of the most heavily taxed among the various industries. In France, as in this country, private operation is favored, but the expansion of the local transportation system, at least in Paris, is much more closely directed by the authorities than here. The question of a direct subsidy is still a debated question in France.

Finally, the author suggests some standards by which speeds, capacities and types of local railway lines in cities of different sizes may be determined. Judged by his rules, most—if not all—American cities are far behind in the extent of local transportation facilities which they should have. Whether most French cities have transportation which meets the requirements given, his paper does not state.

Incidentally, the tables presented in the article mentioned should prove of great interest to all transportation men. By these tables American readers can compare their own operations with those of various cities abroad.

A Record of Progress Against Great Obstacles

FEW annual reports made during the last year have emphasized more clearly the appreciation on the part of the management of the changing aspects of surface transportation than does the report recently presented to his stockholders by President Slaughter W. Huff of the Third Avenue Railway, New York City; for the year ended June 30, 1926. Large expenditures for equipment were made by the company in the full belief that they would stop the downward tendency in receipts and the upward trend in the cost of operation. And they have. The results for the year prove it. Receipts have increased and expenses have decreased just as the management believed they would. In consequence the financial condition of the company has improved, and the management believes it will continue to improve. On its statistical side the report shows a change from a deficit of \$102,138 for the year 1925 to a profit of \$37,893 for the year 1926. That, of course, is heartening to the company's security holders, but the figures do not tell all the story.

Most important is the attitude of the management with respect to problems still before it. These it is look-

ing square in the face. It realizes the necessity of having the system in a strong financial position, either to buy buses to engage in bus transportation in a large way, or to contend with a certain amount of bus competition. In furtherance of this policy the company not so long ago took over the Westchester Street Railroad in White Plains at public auction at an advantageous price, and so placed itself in a position to supply the communities centering around White Plains with such surface transportation as may best serve their purpose, either by means of electric cars or buses.

There was a time when the Third Avenue system appeared far flung, extending as it did from Manhattan Island into the far reaches of the Bronx and Westchester. The once-outlying territory has grown rapidly until now it furnishes more than half of the total revenues of the system and, mark this well, all of its increase in revenue! As Mr. Huff says, the recent extension of the operation of the Third Avenue system into adjacent territory should protect not only the territory already served, but should mean much to the future prosperity of the companies which comprise the Third Avenue system.

The road was hard hit by the opening of the new subways in 1918, but since 1920 there has been, with one single exception, a steady annual increase, until last year the receipts totaled more than \$14,500,000, compared with less than \$10,000,000 in 1918, a figure comparable with receipts in 1913. That is the measure of how the system has overcome unusual obstacles. There may still be others ahead of it. This fact the management senses and appreciates to the extent that it has set its house in order so as to anticipate them. And in doing that it would appear to have met any possible future contingency more than half way. The recent history of the Third Avenue Railway proves that a conservative financial policy and a strong cash position are bulwarks that weather economic storms.

Widespread Acceptance of Zoning Principle Promises Well for Local Transportation

MORE than 70 per cent of the cities in this country having populations of over 100,000 each have adopted zoning ordinances. New York, Chicago, Boston, Baltimore, Pittsburgh, Los Angeles, Buffalo and San Francisco head the list. Hundreds of the smaller cities and towns have followed suit. At present some 27,000,000 people, or more than half of the urban population, live in zoned municipalities. Comparison of this figure with the total of slightly less than 11,000,000 living in zoned municipalities on Jan. 1, 1921, gives evidence of the encouraging progress being made. For this no one will be more thankful than the local transportation officials, whose problems have been much complicated by lack of adequate zoning in the past.

Opposition to zoning still persists to some extent, coming chiefly from real estate speculators. In certain localities they have been able to secure legal decisions which have undermined the effectiveness of zoning ordinances. Usually this has been because the proponents failed to show that zoning promotes health, safety and general welfare. Lack of information concerning zoning in other places often has handicapped progress. People have hesitated to take a step which they considered to be an experiment, whereas in reality its practicability had already been proved many times. The Division of Building and Housing, U. S. Depart-

ment of Commerce, is doing good work in disseminating information on zoning. Recently a standard state zoning enabling act has been prepared under the auspices of the department containing many helpful suggestions. Electric railways can give valuable help in this important movement by emphasizing the importance of zoning from the transportation standpoint.

The Night Hawks of Times Square

METCALF has been writing theatrical criticisms for New York papers for many years. At one time he was on *Life*. More recently he has been on the *Wall Street Journal*. He is probably the dean of his profession in New York. Certainly he is one of the most outspoken of the theatrical commentators. He writes not only criticism of plays, but he touches subjects akin to the profession of the producers. A few nights ago he took for his subject the multiplication of theaters in the Times Square district, heading his article "Whither We Are Drifting." He says that the opening very soon of several mammoth show houses will tend to complicate still further an already complicated traffic problem. It certainly will. Long since the taxi became inexpedient as a means of approach to the theatrical district at the theater hour. Most accessible are the subway lines, which disgorge their hordes in streams with a cross-section greater than that of the rush hour.

In and about Times Square, in fact, there has grown up a new rush hour. The Public Service Commission and the railways have been concerned about it for a long time. Theater opening hours are now staggered, where once they were fairly uniform. That has helped, but not very much. It is a problem, peculiar perhaps to New York, but it is a serious problem. Every one who has been a part of the milling mob on pleasure bent in Times Square at night and on matinee days has experienced the discomforts not alone of transit but of lack of space on the street surface. A few years ago the dark recesses of the streets just off Times Square afforded vehicular and pedestrian by-ways of easy approach to the theatrical district. Now even these are a thing of the past.

Figures are not at hand of the seating capacity of the theaters just off Times Square, but the number of houses is legion and the desire for more and more entertainment appears to continue unappeased. The big Paramount Theater will open in a few weeks. Soon thereafter will come the premiere of Roxy's gigantic new playhouse. Others not quite so large or well known are in the last stages of completion. To the problem of securing a seat in any one of these places will soon be added the one of actually getting there. Where once the traffic movement was centripetal it is now centrifugal. It may be the New York way, but it is not a good way—good either for the railways or the seekers of entertainment. The problem in transport thus presented may not dampen the ardor of the persons on pleasure bent, but neither will it add to their gayety. Moving sidewalks underground auxiliary to the railways might help. One thing is certain. The intensity of the congestion is something the transit companies alone can do very little to alleviate. They will, however, probably continue to be damned for the existence of conditions they are in the main powerless to remedy. That, indeed, is unfortunate.

Indiana Service Corporation's New Cars Have Many de Luxe Features

Two Parlor Chair Buffet Cars and Five Motor Coaches with the Same General Type of Construction Have Ultra-Comfortable Seats—Low-Voltage Lighting Unaffected by Varying Line Voltage—Easy Riding Trucks and Latest Pullman Car Conveniences



One of the New Interurban Trains of the Indiana Service Corporation

BELIEVING that attractive, comfortable and fast transportation is most essential for improved interurban service, officials of the Indiana Service Corporation, Fort Wayne, Ind., have just placed in operation seven cars with many conveniences previously to be found only in Pullman car service. Of these cars two are parlor chair buffet cars and five are combined passenger, smoker and baggage coaches. While the parlor cars are intended only for train service attached as trailers to the motor coaches, they are equipped with two 125-hp. motors so that they will provide some of the tractive effort necessary to propel them in fast express service and also enable them to be moved about in terminals and yards under their own power. Two-car trains with this equipment give four-hour service between Fort Wayne and Indianapolis, which cities are 140 miles apart.

In general appearance and construction the two types of cars are the same. The differences are only such as are made necessary by the changed interior arrangement. Both types of cars have end platforms and are of the same length. The five motor coaches are divided into three compartments longitudinally. The baggage compartment, including space used on the platform, is 13 ft. 4½ in. long. The smoking compartment is 15 ft. long and is provided with ten cross seats so as to provide a seating capacity of twenty. The main passenger compartment is 26 ft. long and is provided with fifteen cross seats to give a passenger

seating capacity of 30. One corner of the main compartment is provided with a lavatory 4 ft. 9 in. long with flush-type hopper.

In addition to having a main passenger compartment 36 ft. long the parlor cars have a men's lounge and smoking room 6 ft. long with seats for six passengers. There is also an electric kitchen 6 ft. long and a lavatory and wash room in one corner which takes a longitudinal space of 4 ft. 9 in. The two parlor cars have been named "Little Turtle" and "Anthony Wayne," these two names being well known historically in the section surrounding Fort Wayne. The motor coaches are numbered but they have no names.

CONSTRUCTION DETAILS

The cars have arched-type roofs and are arranged for single-end operation. The car body frame is formed of structural and pressed steel shapes with continuous center sills and plate side girders. The floor and side framing have cross-bearers to carry the floor load to the side trusses, and special provision has been made in the end and vestibule framing to resist collision shock. The floor, side framing and roof are thoroughly insulated against extremes of heat and sound effects of vibration.

The bumpers are of 12-in., 25-lb. structural channels with flanges turned out. Hedley anti-climbers are used and these are backed with a ½-in. filler riveted to the bumper channel. The bottom edge of the bumper is

reinforced by a $\frac{1}{2}$ -in. plate, 46 $\frac{1}{2}$ in. deep at the center and cut to the radius of the bumper. The top edge of the bumper is reinforced with a similar plate having the inner edge flanged outward to form a bearing for the vestibule end. This construction of the bumpers insures that all flanges or ribs make contact and interlock to form a strong collision resistance. The center sills are of 6-in., 15.3-lb. channels extending in one piece without weld or splice from bumper to bumper with a 27-in. x $\frac{1}{2}$ -in. cover plate in one piece riveted to them. Side sills are 5x3 $\frac{1}{2}$ x $\frac{1}{8}$ -in. rolled angles.

The side frames are composed of rolled and drawn steel shapes, plates and bars. Corner posts are two 3-in., 6.7-lb. rolled zees connected with malleable castings to form a unit. Side plates are 3-in., 6.7-lb. sheathing. Letter panels No. 12, stretcher leveled steel, and the belt rail angle 3x3x $\frac{1}{2}$ in. notched around

frame is covered with a $\frac{1}{8}$ -in. steel cover plate riveted securely to sills and cross bearers. Yellow pine furring strips are bolted to the underframe for floor fastening. Between wood furring strips and on top of the cover plate are two layers of $\frac{1}{2}$ -in. Salamander insulation. Flooring is made up of two thicknesses of $1\frac{1}{8}$ -in. x 3 $\frac{1}{4}$ -in. clear seasoned long-leaf yellow pine with two layers of waterproof tar paper between. In the motor coaches on top of this double floor in the passenger compartment is laid a covering of $\frac{1}{2}$ -in. battleship linoleum. The baggage compartment is covered with $\frac{1}{8}$ -in. Firmtread plates. In the two parlor cars the floor in the passageway to the end of the men's lounge and in the men's lounge is covered with $\frac{1}{2}$ -in. battleship linoleum. The floor of the main passenger compartment is covered with carpet. The kitchen has a copper-covered floor and wood floor mats. The interior finish is of plain design.

Between the side window posts from the floor to the window opening and from the top of the window opening to the top of posts sheet steel and aluminum are used with suitable moldings. The headlining is of $\frac{1}{2}$ -in. Agasote. Joints and carlines are covered with mahogany molding. Insulation of $\frac{1}{2}$ -in. Salamander is installed between the headlining and the roof. No racks are provided for advertising signs, a refined appearance to the interior being thus secured. In the parlor cars the inside from the floor to the window sill is finished in Dublin gray. From the window sills to the ceiling silver gray is used and the entire ceiling is pearl gray.

Parcel racks with malleable iron brackets and steel tube construction are installed on each side of the smoking and main passenger compartments in the motor coaches. In the parlor cars eight individual parcel racks of Pullman type made of bronze are installed over the side windows. A small rack over each



Looking Forward in the Parlor Car—Comfortable Seats—No Advertising Signs—Table Set for Lunch

the box section of the post and riveted to posts and sheathing.

SPECIAL CARE USED IN ROOF CONSTRUCTION

Carlines are 2-in. x 2-in. x $\frac{1}{8}$ -in. angle sections curved to the desired shape. Ash and oak furring is bolted to each carline. At trolley base locations special provision is made to insure substantial support and to overcome and deaden trolley base vibration. The roof boards are tongued and grooved, thoroughly white leaded, driven tight and fastened with screws. Special care was exercised in applying screws to the roof boards so that they would not come in contact with steel carlines. The roof is covered with National Standard FF roofing in one piece. Suitable gutters are located over each side door and center sash in the rear end to deflect water. Roof mats are oak and suitable grab handles are provided.

Trolley boards are of clear long-leaf yellow pine supported on oak brackets 2 in. wide. Rubber cushions $\frac{1}{2}$ in. thick are placed between the brackets and the roof.

Between side and center sills, the top of the under-

rear door is also provided. All racks are 15 in. wide. The rear vestibule of the motor coaches and the front vestibule of the parlor cars are each provided with a hinged door on each side. These are of ash 1 $\frac{1}{2}$ in. thick. The lower portion is paneled, and $\frac{1}{8}$ -in. plate glass is installed above. The parlor cars have two hand-operated doors at the rear which are for emergency use only. These are provided with steps and add to the appearance of the car. Sliding doors are provided in the sides of the baggage compartment. These are of steel paneled in the lower half and glazed in the upper half with 32-oz. Holbrook glass. A door is also provided in the left side of the motorman's cab which harmonizes with the other car construction. Body end doors and other doors inside the cars are of mahogany.

All side window sash on both types of cars are of Rex Beadless type made of bronze with a bottom rubber bumper and Rex side weatherstrip. There are fourteen windows on each side of the motor coaches and fifteen on each side of the parlor cars. All are arranged to raise, and a rack is provided of sufficient length to permit the sash to raise the full height of the window

opening. All side windows in the main and smoking compartments of the coaches and all side windows in the parlor cars except those in the saloon are fitted with storm sash arranged to raise. As the rear of the parlor car serves as an observation section, it is provided with three sash, each with single glass. The center sash is arranged to drop and the side sash are stationary. The center sash is also provided with ratchet bars so that it can be kept open at various heights.

Special attention has been given to the installation of all sash so that they will raise freely without lubricant. Glass in the side body and storm sash is of one size and of standard measurements, so it is unnecessary to cut glass to fit. All windows in passenger compartments are provided with Pantasote pattern Morocco curtains. The left sides of both types of cars have five bar window guards made of $\frac{1}{2}$ -in. steel pipe and provided with malleable iron brackets. The guards are made in sections; each section covering two windows. They are arranged with hinges at the bottom so as to swing down. The three rear windows of the parlor car are provided with a 1-in. iron pipe guard on the outside and a $\frac{1}{2}$ -in. aluminum pipe on the inside.

COMFORTABLE SEATS A PARTICULAR FEATURE

The seating arrangement of the two types of cars is necessarily quite different, but particular attention has been given to provide comfort for passengers. The main compartment of the passenger coaches has fifteen stationary cross seats. The seat spacing is 36 in. Seat cushions, 40 in. long and with backs 28 in. high, are of automobile type with deep springs well padded. In addition to these cross seats there are two bulkhead seats against the smoking compartment partition and one longitudinal seat in the rear right-hand corner. The smoking compartment is provided with eight regular stationary cross seats and two bulkhead seats against the baggage compartment. The seats in the smoking compartment are covered with genuine Spanish crush gray leather and those in the main compartment are covered with striped mohair plush. The color scheme is gray and tan.

The parlor cars are arranged with 23 chairs having the backs toward the sides of the car except the two rear seats, which are turned at an angle so as partly to face the rear. Cushions are of automobile type, well padded with deep springs, and are 18 in. wide. The backs are 24 in. high with spring construction. Cushions, backs and head rolls are all covered with genuine Spanish crush gray leather. The men's lounge is provided with two seats with backs along the front and rear partition. Cushions and backs are covered with genuine Spanish brown leather.

Both hot water and electric heating systems are installed. The electric heating is automatically regulated by thermostats set at 60 deg. Electric heat is of particular advantage in the spring and fall when weather conditions do not necessitate starting up the

hot water heating system. It was considered desirable to have the hot water system, however, in order to provide for heating during loss of power. Each of the five motor coaches is provided with a Peter Smith hot water heater installed in a corner of the baggage compartment. Four 2-in. aluminum pipes extend the full length of the car on each side between bulkheads. A shield of No. 12 steel covers the pipes between seats. In addition the motor coaches are provided with 24 Railway Utility Company's 500-watt double-unit strip cross-seat heaters. These are of double-end type and the heat is automatically regulated by thermostats. In addition to these heaters in the passenger compartment, a 1,000-watt two-unit strip heater is installed in the motorman's cab.

Each parlor car is provided with an Arcola hot water heater installed in a corner opposite the saloon.



Looking to the Rear in the Parlor Car—Large Windows with Awning Give Comfortable Observation Section

Aluminum pipes of the same type as is used in the coaches provide for circulation of the hot water. Electric heat is furnished by 27 Railway Utility Company's 375-watt double-unit strip panel heaters. A heater circuit of three heaters installed in the lounge of the parlor car is provided with a snap switch so that it can be regulated independently of the thermostat. This is desirable since the thermostat is installed in the main passenger compartment of the car, and since the lounge is comparatively small there would be danger of it becoming overheated if the heaters were controlled by the thermostat.

Ventilation in the parlor cars is provided by five Railway Utility Company's compensating intake ventilators and eleven exhaust ventilators. The motor coaches have six compensating intake ventilators and nine exhaust ventilators. All are equipped with registers for the proper control of the air. Of the ventilators in the motor coaches, there is one intake and one exhaust ventilator in the baggage compartment, and the smoking compartment has two intake and two exhaust ventilators. In the men's lounge of the parlor cars there is one intake and one exhaust ventilator,

and one exhaust ventilator in the passageway. The kitchen of the parlor car is equipped with a 12-in. vertical exhaust fan and one intake ventilator.

LOW-VOLTAGE LIGHTING PROVIDED

Fluctuating voltage on the line led to the use of a storage-battery lighting system with a 32-volt generator set. The batteries are Exide, 200 amp.-hr. capacity, and the motor-generator is Westinghouse 1½ kw. The cars are also wired for direct-current lighting in emergencies. The main lighting is from dome fixtures, but these are supplemented by bracket lights. Each of the domes has a 75-watt lamp and the bracket lamps are 25 watts.

The front end of the car is arranged to carry a portable incandescent headlight in addition to a small incandescent headlight which is fixed permanently in the center of the dash. Each step has a lamp installed behind a semaphore lens on the bottom riser of the step. These are on whenever the car lights are energized.

When the motor coaches are operating in single car service, signals from the conductor to the motorman are by means of an air whistle operated by a cord running through the car. For multiple-unit or trail-car operation a single-stroke electric bell is installed in the motorman's compartment and an electric pull switch is installed in the front vestibule of the trailer. This pull switch is wired through the train-line jumper so as to operate the single-stroke bell. The pull switch is operated by a bell cord running along the right side of the car. In addition the motorman can signal the conductor by using a push button convenient to his seat. This operates a buzzer over the conductor's seat.

For propelling the car, the motor coaches are each equipped with four Westinghouse No. 333 VVD-6, 125-hp. motors and the parlor cars with two motors of the same type. HL single-end control arranged for multiple-unit operation is provided. All power wiring is run in metal conduits with the necessary junction and connection boxes. Control cable wires from the end junction box to the train-line receptacles on the draw-bars are run in six-ply rubber hose. All controller and air-brake piping in chair cars at the motorman's position is sealed in with a cabinet. A cabinet is also provided for all switches and fuses in one location.

Air brakes are of Westinghouse automatic type arranged for single-end, multiple-unit operation. Compressors are of General Electric type, two compressors being used on the motor coaches, one of 25 ft. and one of 15 ft. capacity, and one compressor of 15 ft. capacity is installed on the parlor car. A hand brake, provided



Tan and Gray Stuffed Mohair Plush Seats Give an Attractive Interior

with a drop ratchet brake handle, is installed in the motorman's cab of the motor coach. The front vestibule of the parlor car also has a similar type of hand brake. All brake-rod jaws and levers have case-hardened seamless steel bushings. All brake pins are case hardened, and particular attention has been given to the installation of brake rods and levers so as to prevent rattling and vibration.

Each car has two Baldwin trucks with 7-ft. wheel-base. These are the same as those used by the Chicago, North Shore & Milwaukee Railroad except that they are not provided with third-rail shoe attachments. The trucks have 6½-in. axles and 5½x10-in. journals. Rolled



The Smoking Compartment Has Automobile Type Seats Upholstered in Genuine Leather

Dimensions and Equipment of Interurban Cars of Indiana Service Corporation

	Motor Coaches	Parlor, Chair, Buffet Cars
Number of cars.....	5	2
Built by.....	St. Louis Car Co.	St. Louis Car Co.
Length over all.....	61 ft. 6 in.	61 ft. 6 in.
Length, main compartment.....	26 ft. 1 in.	37 ft. 0 in.
Length, smoking compartment.....	15 ft. 0 in.	6 ft. 0 in.
Length, baggage compartment.....	13 ft. 0 in.	
Width over side sills.....	8 ft. 9 in.	8 ft. 9 in.
Width over eaves.....	8 ft. 11½ in.	8 ft. 11½ in.
Height—rail to bottom of side sill.....	3 ft. 7 in.	3 ft. 7 in.
Height—rail to top of roof.....	12 ft. 8 in.	12 ft. 8 in.
Seating capacity.....	50	30
Truck centers.....	38 ft. 6 in.	37 ft. 2 in.
Truck wheelbase.....	7 ft. 0 in.	7 ft. 0 in.
Sheathing.....	No. 12 stretcher leveled steel	No. 12 stretcher leveled steel
Carlines.....	2 in. x 2 in. x ½ in. angles	2 in. x 2 in. x ½ in. angles
Floor—top.....	½ in. x ¾ in. T & G E.G.Y.P.	½ in. x ¾ in. T & G E.G.Y.P.
Floor—bottom.....	½ in. x ¾ in. T & G.Y.P.	½ in. x ¾ in. T & G.Y.P.
Floor covering—passenger compartment.....	½-in. battleship linoleum	Carpet
Floor covering—passageway.....	½-in. battleship linoleum	½-in. battleship linoleum
Floor covering—baggage compartment.....	¼-in. firmhead steel plate	
Floor insulation.....	Salamander felt	Two layers waterproof tar paper
Wainscot and roof insulation.....	Three-ply Salamander	Three-ply Salamander
Letter panel insulation.....	Two-ply Salamander	Two-ply Salamander
Post insulation.....	Hair felt	Hair felt
Headlining.....	Agasote	Agasote
Partitions.....	No. 16 sheet steel	No. 16 sheet steel
Door frames.....	Mahogany	Mahogany
Doors—exterior—baggage.....	Metal	Ash
Doors—interior.....	Mahogany	Mahogany
Seah.....	Rex with storm saah	Rex with storm saah
Glass—body windows.....	32-oz. Holbrook	32-oz. Holbrook
Glass—vestibule windows.....	32-oz. Holbrook	32-oz. Holbrook
Glass—doors.....	½-in. plate	½-in. plate
Glass—front end.....	½-in. non-shatterable Arch	32-oz. Holbrook (rear)
Roof—type.....	½-in. x ¾-in. T&G National standard	½-in. x ¾-in. T&G National standard
Roof boards.....	F.F. roofing	F.F. roofing
Roof covering.....	Hedley ¾-in. O. M. Edwards balanced	Hedley ¾-in. O. M. Edwards balanced
Anti-climbers.....	Dayton Mfg. Co. No. 88	Dayton Mfg. Co. No. 88
Step trapdoors.....	Pantasote	Pantasote
Door holders.....	Railway Utility Co.	Railway Utility Co.
Curtains.....	Peter Smith	Arcola No. 511
Ventilators.....	Railway Utility Co.	Railway Utility Co.
Heaters—hot water.....	Railway Utility Co.	Railway Utility Co.
Heaters—electric.....	thermostatic	thermostatic
Electric heat control.....	36-in.	
Seat spacing.....	Automobile type	Heavily padded chair type
Seat cushions—main compartment.....	striped plush	
Seat cushions—smoking compartment.....	Automobile type genuine leather	Automobile type genuine leather
Window guards.....	½-in. pipe in sections	½-in. pipe in sections
Gongs.....	¼-in. with Crewson pneumatic ringer	¼-in. with Crewson pneumatic ringer
Trolley retriever.....	No. 5 Knutson Economy	No. 5 Knutson Economy
Energy-saving device.....	Enameled steel tubing	Pullman type bronze
Parcel racks.....	Feralun	Feralun
Step treads.....	Ohio Brass	Ohio Brass
Headlight—dash center.....	Golden Ray	Golden Ray
Headlight—top of dash.....	Electric Service Supplies Golden Glow	Knight pneumatic Ohio Brass Co.
Sander trap.....	Knight pneumatic	
Sander valve.....	Ohio Brass Co.	
Warning signal.....	Strombos Simplex Steel	
Pilot.....	Railway's standard Tomlinson No. 13	Railway's standard Tomlinson No. 13
Flag and lamp brackets.....	Pyrene	Pyrene
Couplers.....	Statuary bronze	Statuary bronze
Fire extinguishers.....	32-volt 75 and 25 watt Adams & Westlake	32-volt 75 and 25 watt
Hardware fittings.....	Dome & E.S. Supplies side bracket	
Lamps.....	Westinghouse 1.5 kw. Exide 200 amp.-hr. Westinghouse automatic	Westinghouse 1.5 kw. Exide 200 amp.-hr. Westinghouse automatic
Lighting fixtures.....		
Motor-generator set.....		
Storage battery.....		
Air brake equipment.....		
Compressors—two on motor, one on trailer.....	General Electric C.P. 27 and C.P. 28	General Electric C.P. 27
Anti-freezer.....	Anti-freezer Co.	Anti-freezer Co.
Hand brakes.....	Peacock drum	Drop ratchet
Motors.....	4 Westinghouse 333 VVD-6 125 hp.	2 Westinghouse 333 VVD-6 125 hp.
Gearing.....	Helical	Helical
Control equipment.....	Westinghouse HL single end	Westinghouse HL single end
Trolley base.....	U. S. 13	U. S. 13
Trucks.....	Baldwin	Baldwin
Painting.....	Pratt & Lambert	Pratt & Lambert
Weight.....	Vitalite 96,000 lb.	Vitalite 89,000 lb.

steel wheels 37 in. in diameter and with 3½-in. tread are used. Particular attention has been given in the design of these trucks to provide easy riding. The bolster springs have auxiliary helical springs. These latter take care of light loads and all springs work together with heavy loads.

The miscellaneous equipment of the cars provides many things intended to give comfort and convenience to passengers. These include window screens, foot cushions, match strikers, awnings at the rear of the parlor car, holders for drinking cups, coat and hat hooks, water coolers, seat covers, electric fans, tables, cuspidors, and the parlor car contains a fully equipped electric kitchen. This kitchen has an electric hot plate, electric toaster, Frigidaire refrigerator, table, sink, linen cabinet, cabinet for brooms and clothes, electrical washer, pie racks, tray racks, knife racks and many drawers and shelves for convenience. Two 40-gal. galvanized steel water tanks are provided for supplying the sink.

The cars have an attractive color scheme, Pratt & Lambert's Vitalite light tan being used as the principal body color. Lettering and striping is railway enamel green, edged with red. The roof is painted battleship gray and all window rods, steps, etc., are black.

Pick Up and Delivery Express Proves Profitable

Illinois Traction System Has Established Complete Service Using 22 Ford 1-Ton Truck Chassis with Special Bodies, Uniformed Drivers and Regular Passenger Facilities

ONE of the outstanding developments on the Illinois Traction System during the past year was the establishment of a complete collection and delivery express service. Details of the plan are given in the presentation of the company in the 1926 Coffin Prize Competition. The company first started its own service for the handling of express shipments in July, 1919. Previous to that date the Adams Express Company operated on the Illinois Traction System, but because of the consolidation of express companies during the war and the fact that the resultant American Railway Express Company was under federal control, the Illinois Traction System found it necessary to establish its own express service. This service was limited to station handling at rates 25 per cent lower than those charged by the express company because of the fact that no collection and delivery service was rendered. This was really nothing more than expedited less-than-carload freight.

On Jan. 8, 1926, the Illinois Traction System inaugurated collection and delivery of express shipments of the same nature within the same zones and at the same rate as the American Railway Express Company in the territory served. To handle this collection and delivery service properly the company purchased 22 specially designed 1-ton Ford trucks, which were distributed to the principal points along its line in charge of uniformed drivers. At stations where the potential business did not warrant maintaining a truck and driver contracts were made with existing local trucking companies for the collection and delivery of freight.

When it was decided to start collection and delivery express service it became necessary to select a suitable

vehicle. Investigation disclosed that except in rare instances a 1-ton truck chassis would be ample for all loads. Hence this capacity was adopted. Since the trucks were to be distributed over a territory of 450 miles with only one, two or three trucks to a town, as the business might warrant, it was considered advisable to secure a popular make of chassis that could be operated and maintained at low cost, could be housed in a public garage and for which necessary repair parts, shop facilities, tool equipment and trained mechanics could be readily obtained. Since there are Ford service stations in all the towns in which the trucks operate, this type of chassis with high-speed gear was selected, as it can be served most conveniently.

Truck bodies were designed by the company's engineers and constructed in its shop. The design avoids the usual side stakes or posts, the only framework consisting of corner posts, top plates and sills, which are made of white oak, and to which the side panels, consisting of $\frac{1}{8}$ -in. Plymetl, are bolted. These panels are attached and reinforced by light steel angles and plates. The bodies were designed to permit easy and rapid repair and the entire structure is screwed and bolted together in a way that makes it possible to remove a damaged piece without disturbing the balance of the structure.

ILLINOIS TRACTION SYSTEM EXPRESS SERVICE
COMPARATIVE EARNINGS, FOUR-MONTH PERIOD

Trucks	Forwarded		Received	
	1926	1925	1926	1925
Bloomington	\$1,115.95	\$681.04	\$1,112.56	\$561.22
Carlinville	761.44	423.87	1,165.69	665.08
Champaign	621.55	318.81	1,045.04	223.02
Danville	921.00	745.07	452.89	124.13
Decatur	3,319.06	1,696.13	1,755.47	560.66
Granite City	276.18	209.07	215.96	50.37
Hillsboro	67.11	40.19	358.02	327.67
Monticello	19.35	16.22	367.37	213.92
Peoria	3,237.83	1,381.37	3,306.16	325.60
St. Louis	10,771.37	4,039.89	1,349.10	811.71
Springfield	3,050.63	2,646.53	2,517.02	1,423.49
Urbana	105.70	70.94	266.00	76.97
	\$24,267.17	\$12,274.13	\$14,911.23	\$5,363.89
Contract Arrangements				
Bement	\$6.70	\$6.95	\$103.28	\$63.54
Clinton	303.70	112.24	1,056.34	255.93
Edwardsville	190.09	340.18	251.16	151.15
Gillespie	98.88	78.87	997.75	1,101.14
Lincoln	187.01	133.78	757.38	408.31
Litchfield	260.43	300.87	838.89	454.66
Mt. Olive				
Staunton	79.15	64.60	704.52	586.36
Viriden	123.32	85.79	428.77	352.12
	\$1,322.29	\$1,167.63	\$6,389.84	\$4,148.54
Other Stations	\$758.66	\$470.43	\$5,041.85	\$4,430.81
Total	\$26,348.12	\$13,912.19	\$26,342.97	\$13,943.24

on the paralleling hard roads along the entire line of the Illinois Traction System. This "parade" was announced in advance by display advertisements and articles in the local newspapers and when it reached



One-Ton Ford Truck Chassis Equipped with Specially Designed Bodies Are Used by the Illinois Traction System for Pick Up and Delivery Express Business. This Service Was Widely Advertised in the Company's Territory by a Parade of Its Equipment During the Holidays at Christmas

The body is high enough above the wheels to bring the floor line above the fenders. This permits the use of standard fenders at low cost, and at the same time makes what is claimed to be a stronger, lighter and roomier body construction than would otherwise be the case.

The trucks used in this service are in most cases housed and maintained in connection either with the company's local carhouse or freighthouse at the point where they are assigned. They are driven by uniformed employees. A special effort was made to secure a type of uniform that would be attractive as well as serviceable. This is similar to that used by bus operators in large cities and a special effort is made to secure men for this service who have an attractive personality. The trucks operate from the local passenger stations and form a very desirable contact between business houses, residences and the electric railway.

EXPRESS EARNINGS DOUBLED

To announce this new service and advertise it in the railway's territory the entire fleet of 22 trucks was paraded during the holiday week between Christmas and New Year's over a route aggregating some 720 miles

the cities along the lines its entry was announced with bugles and a publicity representative furnished all the newspapers with stories and cuts. As a result, the people in the territory served were well informed concerning the type of equipment and the service to be rendered before it was actually started. Large display advertisements, pamphlets, circulars, etc., were used further to increase this publicity.

The actual handling of this express service is accomplished with no addition to the traffic department personnel other than the drivers of the trucks. Express is handled largely on regular passenger cars, and, with few exceptions, without the addition of messengers. The growth of this business has been such that the company recently rebuilt two obsolete passenger motor cars for motor-express service. These cars haul passenger trailers on regular runs.

The development of new business is shown by increased earnings under this arrangement. This is clearly shown in the accompanying comparative statement for the first four months period, from Jan. 1 to May 1, 1926, indicating an increase of practically 100 per cent in express forwarded and express received over the same period for the previous year.

Grumbling Sells No Transportation*

Better Results Can Be Obtained by Telling the Public the Story of
Electric Railway Accomplishments than by Talking
About Operating Difficulties

By C. S. Ching

Supervisor of Industrial Relations United States Rubber Company

HAVING had about seventeen years experience in the street railway field, I feel that I can speak as one of the family. The concern with which I am now connected is in the manufacturing business—manufacturing products, selling to the public, in competition with other manufacturers. When the consumer gets our product we are many miles away. He buys our product through someone else and he consumes it over a period of months or years. In the street railway business, the railway is in touch with the consumer from the moment he starts to make the purchase until the product is entirely consumed.

In the year 1920 our advertising appropriation was more than \$7,000,000 to get the public to buy our product. The street railway doesn't need advertising of that kind to tell the public about its product, because its salesmen are on the job all the time. Notwithstanding that fact there isn't a poorer bunch of salesmen in the world than the transportation men. I think that the transportation people are the poorest salesmen that God ever let live.

There are a lot of street railway men—and I was one of them—who say when talking about the business with a friend or neighbor, "Keep out of this business. It is a deuce of a job. It is nothing but a dog's life. You have to be on duty 24 hours a day and you get darn little thanks for it and not much salary."

Don't you find that attitude a whole lot in the street railway business? You don't find it in other concerns, yet they probably pay lower wages than street railways do.

We all know that our street railways have been unfairly treated, but Mr. Public is not interested. He says, "Go tell it to the cop." There is nobody interested in your troubles. It seems to me that the street railways have taken a whining attitude. It got into the street railway business about fifteen or twenty years ago at the time when it was discovered that it was not a bonanza. That has gone altogether too far. You have been telling the public a lot of your troubles, and the public doesn't give a darn about your

There isn't a poorer bunch of salesmen in the world than the transportation men. . . . Street railways have taken a whining attitude. . . . That has gone altogether too far.

viewpoint. Of course, you need money to do things. You have got to have money in order to give the public the service it wants. You have got to get the money from the public in the first place. But the point is that the public will help you only when you tell the story of your accomplishments, and not the story of your troubles.

This matter of public opinion and how it is molded is one of the most intangible things that it is possible for us to consider. Theatrical men, too, have their troubles with public opinion, but if a new show lasts for a week and people begin talking about it, they go to the show and tell others about it. If conversation gets started, "Have you seen that show?" then the show is a success.

It is the contact that each man in the transportation industry has with the people he meets that influences public opinion. If we can get an attitude into the employees of transportation companies similar to that which the American Telephone Company has been able to get into its employees—the spirit of service, the spirit of pride in the job they are doing—then we will have infinitely better salesmen out on the road.

That attitude on the part of the employee is but the reflection of the attitude of the supervisor and the superintendent and the general manager and the president and the board of directors. In other words, you have got to have all up and down the line a group of men connected with the railway industry who feel that it is an important industry, a worthwhile industry, an industry to be proud of. Until that spirit gets across and you get the thought of an important service to the public on every occasion—not through newspaper advertising, but through contact of the people in that industry—the old idea will persist. When you do that, then you are going

The public doesn't give a darn about your troubles. They ought to. It is their responsibility. But the public is not interested in its responsibilities.

*Abstract of a talk given at a meeting of the Metropolitan Section, A.E.R.A., New York, N. Y., Nov. 5.

to have public sympathy and public support in the things you are trying to do that you can never get by telling people a sad story.

Take the steam railroads throughout the country today. There has not been a time in the last 25 years when the steam railroads of this country were in such good standing with the public as they are today. You don't hear of attacks on steam railroads as you used to a few years ago. I am not speaking about what may happen in Washington before the Interstate Commerce Commission, but I am speaking of public opinion generally. That has come about because of an improvement in the service. They have done wonderful things in the way of efficient management in the last five or six years, and they stopped whining. They stopped looking for sympathy and went out and did a job.

One of the characteristic things about the American people is the readiness with which they scrap machinery. The street car itself has been entirely revolutionized in the past twenty years except in the downtown sections of New York. Take the street cars, take the shops, take any of the manufacturing concerns, and you will find that they scrap machinery over night. Power station equipment is one of the best examples of that. Power station equipment is scrapped probably after five, six, or eight years of service for something that is more efficient.

We are the quickest people in the world to scrap old machinery for new. We are the quickest people in the world to adapt ourselves to new methods of transportation or communication. But there is one thing that we ought to keep in mind: we will scrap 50 old machines, but we won't scrap one old idea. That is true very many times. It is harder to scrap old ideas than it is to scrap a million dollars worth of machinery.

In the street railway and transportation business you are in the same position as we in the rubber business. If the leather shoe manufacturers of this country change styles over night, we have got to run to the last factories to have them make up lasts so we can make rubber shoes to fit the change in style, and that means we have to throw away all the old lasts.

We are up against competition to meet the demands of the public. The public sets the pace. What the public wants the transportation company must furnish. There isn't the slightest use in raving about buses. All of you remember the agitation and almost the riots and the injunctions and all that sort of thing that went on when people started to transport the public for a nickel in a flivver. It started in California and wound up in Maine six months later. Everyone was excited about it. But no flivver can take the passengers away from you if you are giving equal service. If the people want to ride in flivvers, that is what you will have to give them. If they want to ride in luxurious buses, that is what you have got to give them.

The transportation company can't dictate how the public shall ride. But the transportation company must

be on the alert to see what the public wants. There isn't very much use in trying to enjoin buses from operating. It may be effective for a time, but when you do it you are antagonizing a portion of the public that you want on your side of the fence.

It may be unfair competition—which it undoubtedly is—but if the street railway people are not alive to the situation of what the public wants and are not willing to show that they are in a position or anxious to give the type of service the people want, then you are going against public opinion, and you are causing resentment which will be turned against you at a time when you want public approval.

We all know that many of the troubles of the street railways come from the acts of salesmen out selling the service. I don't know how you are going to train employees to be courteous. I don't believe that the sign in the Boston subway, "Please do not expectorate here," has any more effect on the traveling public as far as courtesy is concerned than the "Don't spit" sign on the Interborough. I think they are equally effective. I don't believe that it will do much good to run a school to teach conductors to use the right voice inflection when announcing streets. In Boston at one time we had a school for voice training. That may help the man, but merely telling a man to be courteous is not going to make him so. If we can only instill into that man the pride of accomplishment, a pride in his job, courtesy will take care of itself. The public as a public is not looking for automats or for artificial people, but it is looking for men who are men and who are themselves. It is all very well to say "please" and "thank you," but it must not be too mechanical. You have to have the real spirit of service behind it.

The public doesn't realize that some of the men are out all night operating a transportation system. They are on call 24 hours a day. They are there to serve no matter what time they go out. The public doesn't realize that. It is accepted as a matter of course.

Tell the story of what you are going to do for the public, not what the public must do for you. Give the story to it in an upstanding, two-fisted, man-to-man sort of way rather than to say, "Well, this street railway business is all shot to pieces, anyway. You

wouldn't give us an increase in fare and now the tracks are worn out, there is no overhead construction, no allowance for depreciation. What kind of service do you expect? You are to blame for it, not me."

If we in the street railway industry are going to get public opinion on our side, and public opinion is not at present on the side of the transportation companies, we might as well begin now. Then we first have to make contacts at every possible point. We have got to tell the truth even if it hurts. We have got to have our salesmen on the job and have those salesmen represent us as we want them to, and also have them imbued with the spirit that will make them proud of their own jobs.

Tell the story of what you are going to do for the public—not what the public must do for you.

It is harder to scrap old ideas than it is to scrap a million dollars worth of machinery.



Tri-City Railway Car Remodeled to Meet Modern Needs

Dressing Up an Old Car

Softer Seats, Cabinets for Apparatus, Rubber Tiling on Floor and Better Lighting Have Improved Appearance and Increased Comfort

NEARLY all the cars now in use by the Tri-City Railway, Rock Island, Ill., were bought in 1913. Several years ago the bulkheads were removed and the cars arranged for double-end one-man operation. Believing that street cars should be not only safe but also comfortable to ride in, pleasing in appearance and as nearly noiseless as possible, the management recently undertook to remodel extensively one of these old cars.

The old rattan seat covering was removed, extra felt padding added and the seat and back covered with Kemi-suede of a light shade. This soft material gives the car rider a more comfortable seat and improves the appearance of the interior. The floor is covered with white and tan rubber tiling in checkerboard design, with edges bound in brass. This has a pleasing appearance compared with the old car slat floor of painted maple.

Further improvement has been made in the appear-

ance of the car by inclosing all pipes, switches, brake staff and door engines in paneled wooden boxes. As the bulkheads had been removed several years ago, the most unsightly part of the car was previously much in evidence. A neat cabinet now incloses completely the controller and air pipes. Dirt and paper can no longer collect in the corners and crevices along the floor line. Cleaning the car is made easier and the sweepers can do a better job.

As the car is of the double-end one-man type it was thought desirable to provide a door in the rear whereby passengers can alight. Automatic step treadle doors furnished by the National Pneumatic Company were installed. Electric lighted signs with the words "Exit at Rear" have been placed inside the car, while on the front dash appears the sign "Entrance at Front." A large stop light is carried on the rear dash and when the brakes are applied its red glare gives a danger signal to the driver of any vehicles close behind.

Four ventilators have been placed in the windows of the monitor roof. Electric heaters with thermostat control provide additional comfort to the passengers.

Outside the car was given the usual coat of standard



Kemi-suede Seat Covering and Rubber Tiling on the Floor Improve the Interior Appearance



Controller and Piping Have Been Inclosed in Wooden Cabinets

yellow paint, with moldings painted black. An orange band 3 in. wide runs from end to end, just below the windows, and gives a desirable streamline effect. Inside a white enameled roof reflects with good effect the light from eighteen 23-watt lights arranged directly over the seats, nine on each side.

Register rods were removed from the ceiling and foot-controlled pneumatic registers installed. The old roller curtain back of the operator has been replaced by one made of the same material as the seat covering and hung by rings from a rod attached to the vestibule hood. When not in use this curtain is drawn back and inclosed in a box to the left of the operator.

Motorists Warned of Near-by Car Line

PRECAUTIONS taken by the El Paso Electric Company to promote greater safety in the operation of its cars include the installation of warning signs on all streets at the approaches to car tracks. These signs are diamond shaped, supported by posts about 3 ft. high. They carry the warning "Slow Down—Car Line," as



Signs of This Kind in El Paso Warn Automobilists that They Are Approaching an Intersection with Street Car Tracks

shown in an accompanying illustration. The excellent results obtained by the safety work of this company are indicated by the fact that the proportion of gross earnings spent by the claim department for the first six months of the present year was less than 2 per cent. These accomplishments are told in the brief submitted by the company for the 1926 Coffin prize.

Encouraging Suggestions from Employees in Baltimore

WITHIN the last few months the United Railways & Electric Company of Baltimore has established a permanent plan of payment for suggestions from employees either to improve the company's service or to accomplish economies that will not harm the service. The plan is best explained by the following letter which was sent by the president to all employees:

To All Employees of the United Railways:

A permanent plan for payment for ideas which will, first, save money, and, second, improve service to the public, has been agreed upon.

For adopted suggestions from employees which are estimated to produce net operating savings or improve public relations, cash awards will be made ranging from \$5 to \$100, according to the value estimated for these by the efficiency committee.

The following simple rules have been adopted:

1. Suggestions should be sent directly to the Committee on Efficiency, Room 900, Continental Building.

2. Suggestions must be original, and the committee on efficiency awards reserves the right to reject any suggestions which have already been made and considered previous to the institution of the plan.

3. Employees need not confine their suggestions to the work of their own department.

4. Two or more employees may develop a suggestion together and submit it in the names of all, and the award will be divided equally among them.

5. If the suggestion is one which requires time to present in clear, understandable form, the employee may present to the committee a brief written statement of it as soon as he conceives it, thus entitling him to priority in case the idea should be duplicated by another employee before his own plan is ready for submission.

6. Suggestions should be presented in writing, as carefully and as intelligibly as possible, accompanied by any drawings or plans which in the belief of the employee will make the idea clearer.

7. Department heads are urged to offer employees all possible assistance or advice.

8. Department heads are not eligible for the award.

Suggestions may be sent in at any time—there are no contests, no time limits and no competition. *Trolley Topics*, the company's publication, will announce the making of payments from time to time.

When "suggestions" are received, they are sent to the heads of the departments most interested in them, the name of the person making the suggestion being withheld by the committee and a key letter substituted for it. The department head's opinion of the value of the suggestion is then considered by the committee, and it is possible to make the payment upon the pure merit of the suggestion, not complicated by any other matters. Although the plan was announced only this summer, nearly a score of suggestions were received during twelve days, and several of these are likely to receive merit payment.

The company expressly refrained from calling the payments "awards" or "rewards," preferring to have the employees consider the plan as a simple business arrangement involving fair recognition of good work and industrious thinking.

The Car-Riders' Conscience

COLLECTIONS found in the fare boxes of the Kansas City Railways, Kansas City, Mo., each day contain curios sufficient to start a museum. Anything from collar buttons and stickpin heads to welfare officer stars and jackstones are dropped in the boxes by people who are downright careless or by others so optimistic as to imagine the articles might be mistaken for a token. Sometimes the things deposited are mistaken for tokens, but more often the evasive ones are called back and obliged to pay.

Counterfeiting has become such a problem that the company has installed a machine to sort out the articles. One of the favorite fake fares is a token made from the wood of strawberry boxes. The fakes usually have flippant remarks or "wise cracks," as the user probably terms them, printed on both sides. The most common one is "Did you ever get fooled?"

About 60 tokens from other cities are found every day. All tokens are of uniform size and the foreign ones are harder to detect than any of the other counterfeits. Another trick to which the dishonest passenger resorts is that of trading 15 cents for two tokens and then, thinking the conductor is not looking, dropping a cent in the box.

Improved Facilities and Intensive Merchandising Build Profitable Freight Business

Illinois Traction System Increases Freight Earnings from \$1,674,000 in 1924 to \$2,209,000 in 1926—Road Handles Carload and Less than Carload Traffic from Coast to Coast—Has Traffic Agreements with 1,600 Railroads and Boat Lines

A total of 2,900 carloads of grain and grain products going to the markets of the country at Chicago, St. Louis and other points were handled during the last year from 43 grain elevators located exclusively on the lines of the company.



WITH 515.1 miles of its total main line mileage of 555 miles paralleled by new state hard roads, the Illinois Traction System saw much of its short-haul freight business taken by trucks. Whether or not such trucking could be done at a profit in competition with the railroad rates was an unsettled question, but that a considerable volume of short-haul business was going that way was an established fact. Furthermore, the hard road construction program and the subsequent truck competition had developed at a very rapid rate and the railway was therefore faced with a grave situation which required prompt and courageous action. The course taken was to improve railway freight-handling facilities on the one hand while engaging in a carefully worked out and vigorously applied business building campaign on the other.

The success of the methods followed is best illustrated by the following figures, given in the brief presented by the company in competition for the 1926 Coffin prize, showing the earnings from freight transportation:

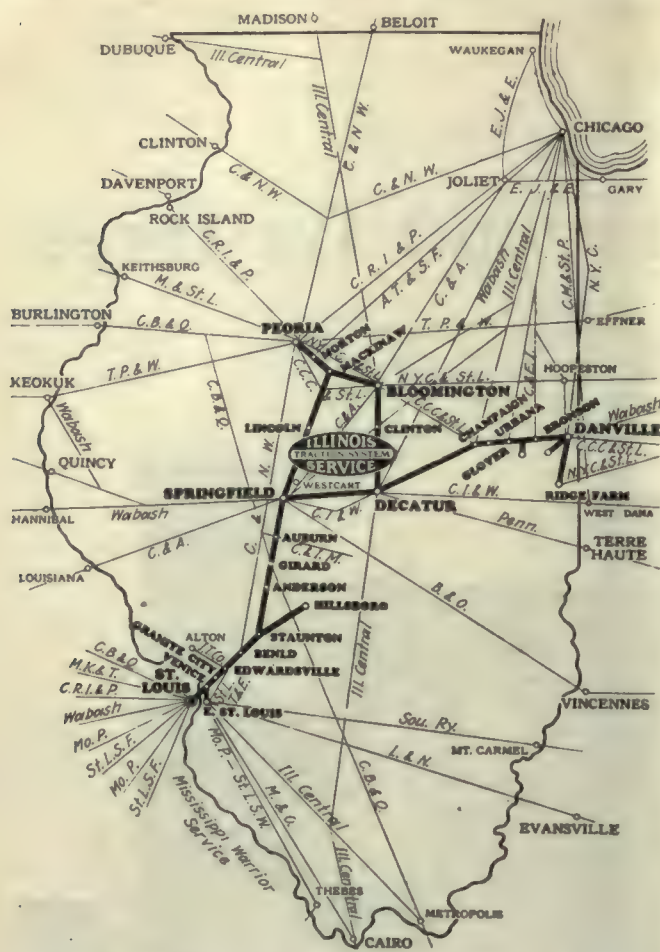
For year ended April 30, 1924.....	\$1,674,000
For year ended April 30, 1925.....	1,730,000
For year ended April 30, 1926.....	2,209,000

These figures do not include the freight earnings of the St. Louis Electric Terminal, the Illinois Valley division or switching revenues totaling \$359,268.76 in 1925, an increase in these items over 1924 of \$23,000.

Physical improvements necessary for properly handling interchange freight traffic have been made on a large scale. Interchange tracks, steam tracks, belt lines around important communities, industry tracks and connections, freight houses and unloading platforms now give access to industries in cities served by the company, facilitate the development of interchange business and place at the service of shippers and receivers of freight physical facilities of a character to insure prompt, reliable and economical service—essential to the building of freight business.

A program of enlarging freight house facilities and the construction of modern new passenger and freight stations in the smaller towns is being successfully carried out in co-operation with the passenger and freight traffic departments, with the purpose in view of continually improving facilities for the handling of all classes of traffic. In pursuance of this policy new passenger stations costing \$10,000, exclusive of real estate, and \$32,700, including real estate, respectively, were built at Mackinaw Junction and Litchfield, Ill. A combination passenger-express station and store building is being erected at Granite City at a cost of \$42,000, including real estate. In Champaign a new freight depot and steam track layout is being constructed at an expenditure of \$84,000 for real estate, building and yard trackage.

To provide better power facilities for the handling of



Through Traffic Agreements Have Been Made with 1,600 Railroads and Boat Lines. This Map Shows Through Freight Routings via Steam Railway and Illinois Traction System. Shipments from Coast to Coast Are Handled

heavy freight loads seven automatic substations were installed on a portion of the main division. With this installation, together with a desire to serve communities along the railway which are supplied with power, it was decided to change the frequency of transmission line circuits from 25 to 60 cycles over a considerable portion of the system. This change-over was made without junking the 25-cycle equipment, all of the old equipment being transferred to sections of the line still operating at 25 cycles and used to increase the capacity of existing stations at strategic points or to divide the territory between stations where the distance was uneconomically long. Substation capacity in the territory changed over was increased from an average of 37 kw. per mile of track to an average of 90 kw. per mile of track.

Development and design by the Illinois Traction System of its type C articulated electric locomotive, which was described in detail in the Jan. 31, 1925, issue of *ELECTRIC RAILWAY JOURNAL*, has been of inestimable value in opening a field of freight haulage hitherto closed by reason of physical obstacles which the new type of locomotive overcomes. The efficiency of this new type of pulling unit is indicated by the fact that the six now in service on the Illinois Traction System constitute only 11 per cent of the hauling units in service, but their use has

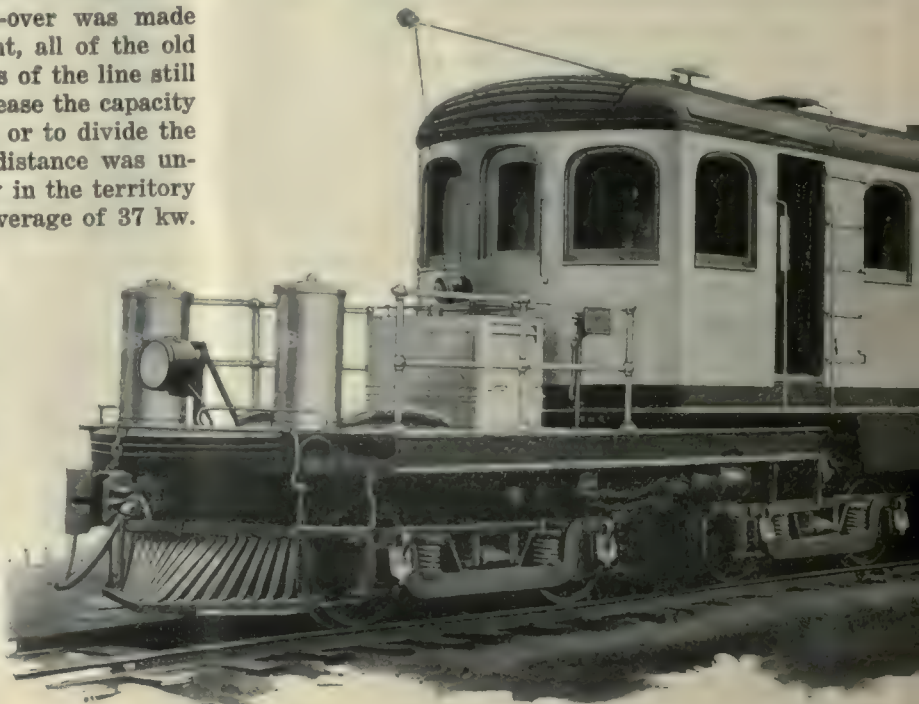
enabled the road to handle 23 per cent more business during a year than was handled in any previous year in the history of the system.

By virtue of the increased freight train speed possible with these improved locomotives a large increase in freight car-miles has been made. In 1924 the figure for the year was 6,966,723. In 1925 freight car-miles amounted to 9,112,189, or an increase of 2,145,566 car-miles. Since this increase in speed affected many foreign cars, on which per diem charges applied, there was a marked decrease in the total per diem charges notwithstanding a high level for volume of business handled. With the aid of these new locomotives the year 1925 is the first year in the last five during which no embargo has been declared by the road, and this despite the fact that the car mileage throughout the entire year never totaled less than 1,000,000 per month.

All the Illinois Traction System freight cars are equipped with A.R.A. and United States safety appliance standards for interchange with steam roads and they are also arranged in a special manner to go around the company's short radius curves. To accomplish this standard A.R.A. couplers are provided with more side clearance than is the usual practice on steam roads. Brake foundation gear and truck levers are arranged in a manner to provide negotiating short radius curves without tightening the brakes. Cars are built with the bottom framing sufficiently above the wheels to prevent interference. The side bearings are extremely long and the limit of curvature is when the wheels stand at such an angle that they will come in contact with the center sills. This makes it possible to take standard cars around a 47-ft. center radius curve.

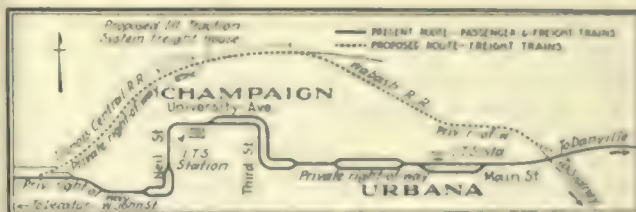
The interchangeable equipment operated by the company includes 310 box cars, 254 flat-bottom gondolas, 257 hopper bottom coal cars, nine refrigerator cars, 98 flat cars and 25 ballast cars. In addition to the interchange equipment for freight handling, the company has fourteen express motor cars, 94 express trailers and two special scenery cars arranged for operation on the company's lines, these being non-interchangeable on account of the radial coupler equipment.

At the present time the company's freight haulage

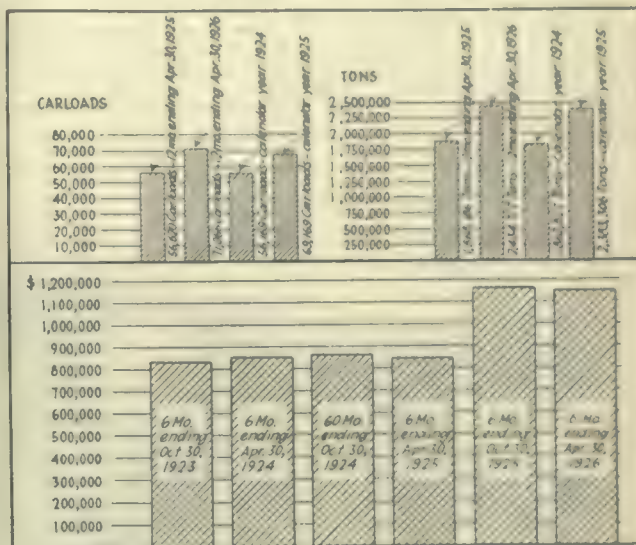


equipment is being supplemented by the addition of 100 steel underframe wood superstructure drop-bottom coal cars of 100,000 lb. capacity. These cars are used for the purpose of allowing handling of coal shipments in one direction and sand and gravel in another direction, thereby preventing one empty haul. They also can be utilized by local coal dealers who use portable elevators for loading coal in wagons from drop-bottom cars. Further, this type of car can be utilized where clamshells are used for unloading purposes, thus making the car a general utility car for coal, sand, gravel, crushed rock and other similar material. The particular feature in design is that although the car has a flat bottom, which makes possible top unloading, it also has a drop-bottom corresponding to an ordinary hopper car.

By the successful negotiation of an agreement for the electrification by the Illinois Traction System of the main tracks of the Illinois Central and the Wabash Railroads at Champaign-Urbana, the electric railway will have, by the addition of a small amount of connecting track, a belt line for freight use in these twin cities where franchise and equipment limitations do not permit it to send freight trains through the streets. The electrification of the tracks of the Illinois Central Railroad extends from Staleys, Ill., to Champaign, Ill., a distance of a little less than 4 miles, and the electrification of the tracks of the Wabash Railroad from Champaign to Urbana, a distance of 2 miles. This, together with the small amount of connecting trackage required, gives a very important belt line at a relatively small cost and at a saving of duplication of investment in railroad trackage in those cities. The new route also eliminates a number of sharp curves and provides an additional interchange for the Illinois Central. Securing the consent of these two steam railroads for this electrification of their own main lines for this purpose is looked upon as something much out of the ordinary in the electric railway field. On this belt line and within three blocks of the business district of Champaign a large piece of property has been bought. Here the company expects to construct a modern freight house with steam track layout having a capacity of twenty cars. The new belt line will permit handling increased carload business through elimination of track obstructions and franchise limitations. It enables the length of trains to be increased and thereby



Duplication of Investment Was Saved in Acquiring a Belt Line Around the Cities of Champaign and Urbana by Electrification of Portions of the Illinois Central Railroad Main Line and a Section of the Wabash Railroad. Map Shows Old and New Routing



Increases in Carloads, Tonnage and Freight Earnings Were Made by the Development of Through Freight Business on the Illinois Traction System. Improved Facilities Made the Increase of This Business Possible

reduces operating cost. At the same time freight house and steam track facilities will be improved. The line haul will be decreased from 6.24 miles to 5.78 miles, the belt line being actually shorter than the main line. Elimination of freight operation from the streets of Champaign and Urbana will permit continuous haul for all classes of freight with no restrictions on equipment.

Completion of the belt line at Champaign will give the system belt line service around all of its principal cities. It already has in operation belt lines around Springfield, Decatur, Edwardsville and Granite City, thus speeding up and facilitating freight movement where it had once been slowed down or even made impossible by city track conditions or city franchise provisions. Steam track facilities have been greatly increased during the year in Peoria, Springfield, Bloomington and Edwardsville. Special platforms for the unloading of automobiles from freight cars have been built at several points.

When truck competition cut seriously into local business it was concluded by the management that the salvation of the property lay in the development of long-haul freight business, and it was therefore necessary to win an equal traffic basis for the arrangement of through rate tariffs and interchange with the steam railroads.

An Intensive Campaign of Physical Improvements and Merchandising of Its Service Has Built Up a Large Increase in Freight Business on the Illinois Traction System. New Articulated Locomotives Developed by the Company Have Greatly Increased Capacity of the System and Have Produced Substantial Operating Economies



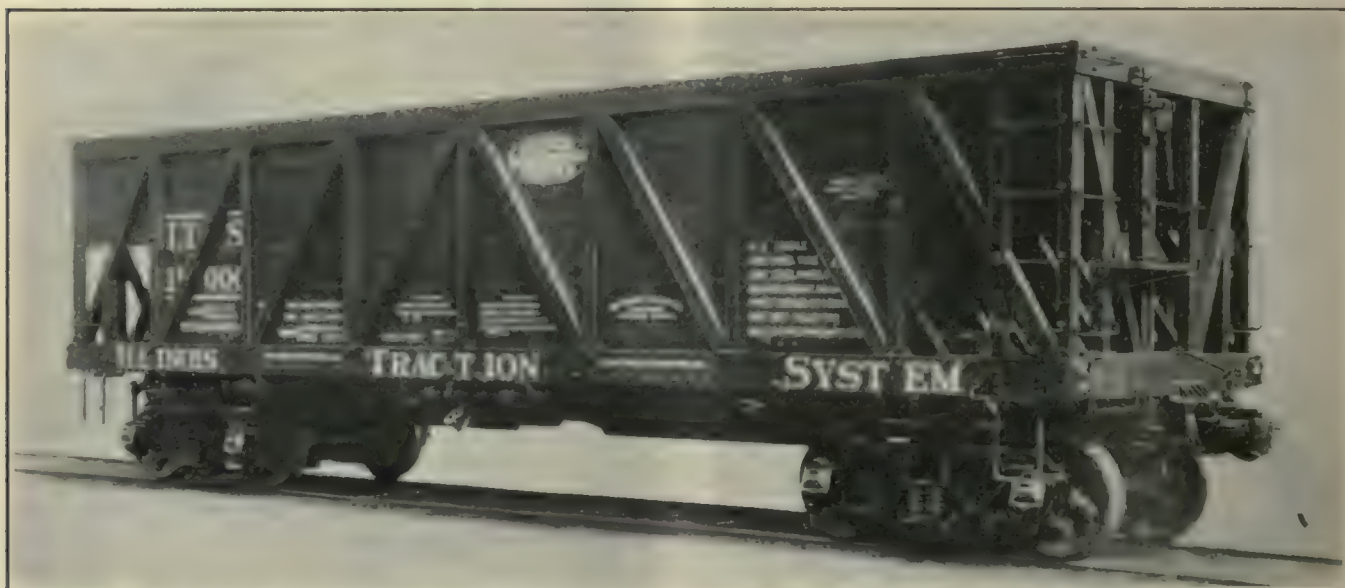
This campaign for recognition was carried on with such success that the road now has traffic agreements with approximately 1,600 existing common carriers, railroads and boat lines reporting to the Interstate Commerce Commission. The Illinois Traction System is now handling carload and less than carload freight traffic from coast to coast and from Canada to the Gulf of Mexico.

In order to stimulate the long-haul traffic the company has recently established off-line general agents in important freight originating distant points as follows: New York, Pittsburgh, Cleveland, Detroit, Chicago, Milwaukee, Minneapolis, Kansas City, and Tulsa, Okla. These agents are working on a per car commission basis on traffic originating in defined territories. Expenses of the agents are paid by themselves. This arrangement has given the Traction System wide advertising and has secured hundreds of cars of freight which would have otherwise been lost to competing roads.

" Much freight as well as passenger business has been

plements, household goods, furniture, beverages, textiles, canned goods and other articles of various kinds. Carload shipments during the year amounted to 62,417, an increase over the preceding year of 14,876. Less than carload shipments during the same year reached a total of 92,194 tons, showing a substantial increase over the year before.

As the company has its own bridge across the Mississippi River and terminals in the heart of St. Louis, merchandise is loaded daily there for the principal points along the lines of the system. Next morning delivery of such shipments is made at local destinations. Important traffic arrangements have been made with connecting lines for the handling of less than carload merchandise. This year an arrangement has been made whereby the merchandise loaded one day in Chicago on the Santa Fé Railroad is received at Morton, Ill., by the Illinois Traction System, transferred to Peoria, Ill., and the next morning put into the various set-out cars loaded



One Hundred New Steel Underframe, Drop-Bottom Coal Cars Recently Acquired by the Company May Be Unloaded with Clamshells or by Dumping the Contents. This Makes a General Utility Car for Unloading Coal, Sand, Gravel or Other Similar Material

picked up through tips furnished by the "Go-Getters Club," employees who have sent in tips relating to future movements which might be secured by the company's agents. Names of those who give these tips are published in "Current Topics," the company's house organ, and much interest has been stirred up among the employees in this work. As an aid in the building of freight business, the traffic department issued an industrial and shippers' guide of 130 pages to encourage closer relations between the company and manufacturers, shippers, merchants and receivers of freight on the system. This guide, which was distributed among shippers, covers the towns and cities located on the Illinois Traction lines, giving a list of all stations, industries in each, their location as to railroad and facts about the cities themselves, their resources, populations and development.

In carload shipments the company made an interesting showing during 1925 with 28,635 cars of coal, 6,989 cars of sand and gravel, 3,908 cars of forest products, 2,900 cars of grain, 2,625 cars of petroleum and petroleum products, 165 cars of potatoes, 3,349 cars of iron and steel, 2,462 cars of brick, 1,413 cars of automobiles, 640 cars of cement, and other carload shipments of hay, butter, cheese, wool, hides, coke, ores, salt, asphalt, sugar, syrup, molasses, boats, lime, plaster, im-

from that point. The scheduled time on such shipments from Chicago to St. Louis, Springfield, Decatur, Bloomington and other points is second morning delivery from Chicago. This is practically as good freight service as that given by the direct steam roads operating between Chicago and St. Louis.

Installation of charcoal heaters has enabled the company to secure a substantial share of the potato movement from the Minnesota district to its own territory during the winter. During the year ended April 30, 1926, 269,673 tons of coal were handled over the system from the coal mine at Gillespie, Ill., owned by the Virginia Coal Company. During the same period hundreds of tank cars of oil were handled from the Oklahoma fields and the Wood River-Roxanna district. A total of 2,900 carloads of grain and grain products going to the markets of the country at Chicago, St. Louis and other points were handled from 43 grain elevators located exclusively on the lines of the company. Close contact between the car distributing department and these elevators has resulted in eliminating the annoyance and difficulty from car shortage with which grain elevators have so frequently contended. Bread is shipped daily from St. Louis to points as far distant as Peoria, Decatur and Champaign, being delivered between 7 and 8 o'clock each morning.

Transportation a Vital Factor in City Growth*

By M. Jajo¹

Inspector-General of Local Transportation in the Prefecture of the Seine, Paris

THE topic of the relation between city planning and transportation will be discussed under the three heads which formed part of the recommendations of the speaker on this subject at the last meeting of the International Tramway, Interurban Railway and Bus Association.† This speaker, Georges Delavenne, member of the Municipal Council of Paris and president of the Paris Transportation Commission, offered for adoption three conclusions, which were as follows:

1. Local city transportation system assists in distributing the population of the city, in encouraging the movement out from the center and increasing to some extent the ability of the city to gain inhabitants.

2. Transportation lines are also necessary in building up undeveloped territory, but their routes in such districts should be laid out under the direction of an impartial and disinterested commission.

3. Transportation lines should seek to supply a service providing a maximum of speed, consistent with the physical and other limitations present, and capacity at all times, so far as it can be done with economy in operation and first cost.

EFFECT OF TRANSPORTATION ON CITY GROWTH

This subject is not a new one to be considered by the international association. It was discussed at length by Mr. Dausset at the 1912 convention and by Mr. Delavenne at the 1924 convention. The latter was particularly happy in his outline of the genesis of modern cities when he said that in their first stage, without transportation, they begin by becoming congested at their centers, but with the expansion of local transportation a centrifugal movement develops and results in an increase in the demand for transportation much in excess of the increase in population. This is clearly shown in Table I, which is based on reports secured from questionnaires sent out by the international association.

This table, however, shows no constant relation between the second and the third vertical columns.

Mr. Brunhes says in his "Geography of Humanity," "A city is not an independent unity; it is affected by the soil on which it rests, the climate in which it exists

The vital relation of transportation to city growth is proved by the experience of different cities, especially Paris. The author also shows the effect of the construction of transportation systems on land values and points out the need for careful consideration of transportation questions and provision for adequate carrier service in city planning. A method is suggested for determining the necessary speeds and carrying capacities of local transportation lines in different circumstances. The article is accompanied by most interesting tables

and the means by which it lives." Transportation cannot be considered the only factor in the growth of cities, but it is doubtless an important, even indispensable, factor of such growth.

The first evidence of the need of local transportation in a growing city is from within. It comes when the demand for ground for new residences and new industries is so great that they can find it only in the suburbs. Without transportation these additions to the city's social and industrial life must either develop new social and business centers close to where the people live or else these enterprises cannot locate within the city at all. With the introduction of transportation the inhabitants can choose their homes on the basis of the time re-

quired to travel between the points where they live and their places of work, rather than upon the distance between the two. The city then enters a new phase of its evolution.

POINTS ILLUSTRATED BY PARIS

It is through this evolution that the city of Paris passed during the nineteenth century. In 1800 it had an area of a little more than 13 square miles. Its average density was 159 inhabitants to the hectaire (or about 64 to the acre), but commerce and manufacture were confined to very small establishments, the center of the city was closely congested and the suburbs were sparsely inhabited. Between 1800 and 1817 there was an increase of 165,000 inhabitants, but local transportation was almost entirely by cab. It was not until the period from 1836 to 1841, the epoch of the development of the steam railroad, that the city began its rapid growth, and in 1856 it had reached a population of

TABLE I—INCREASES IN PERCENTAGE BETWEEN 1910 AND 1925

	Per Cent Increase in Population Served	Per Cent Increase in Passengers Carried	Per Cent Increase in Rides per Inhabitant per Year	Per Cent Increase in Car Miles Run per Year
Glasgow	36	106	53	54
Londres	15	84	53	15*
Brussels	0	75	76	41
Paris	12	105	82	
Marseilles	14	64	43	35
Bordeaux	55	40	10*	51
Strasbourg	13*	58	74	41
Prague	6	53	47	29
Zurich	9	60	47	
Geneva	5	0.7	5*	
Aix-les-Bains	2	47	44	

*Decrease.

*Abstract of paper presented at the biennial meeting of Union Internationale de Tramways, de Chemins de Fer d'Intérêt Local et de Transports Publics Automobiles, Barcelona, Spain, Oct. 10-16, 1926.

†See ELECTRIC RAILWAY JOURNAL for Aug. 2, 1924, page 171.

1,174,436. This period was accompanied by a great decrease in population density in the central sections.

The first common carrier enterprise in Paris was in 1828, when Mr. Baudry received authority to establish a system of buses and eleven lines were put in service. By 1836 the number of buses in operation in Paris reached 378, and in 1856 all of the bus companies were consolidated into one system. In general, the lines operated to the city limits, where they connected with suburban bus lines, and all, of course, were operated by horses. In 1856, also, the General Omnibus Company, the consolidated company, received a franchise to build two street railway lines, and in 1854 the first section of the steam Belt Railway was put in service. Tables II and III give statistics of the Paris local transportation system up to 1890.

TABLE II—STATISTICS OF LOCAL TRANSPORTATION
IN PARIS, 1855 TO 1890

Miles of Route	1855	1865	1875	1885	1890
Omnibus.....	94	183	163	146	150
Tramways.....	..	18	37	175	183
Belt lines, steam.....	..	16	24	26	33
Total.....	94	217	224	347	366
Passengers Carried in Millions					
Omnibus.....	36	104.6	115.6	105.7	114.5
Tramways.....	..	2.8	15.2	136.1	135.6
Belt lines, steam.....	..	4.9	13.9	31.0	34.0
Total.....	36	112.3	144.7	272.8	284.1

TABLE III—RIDES AND TRANSPORTATION EXPENDITURE
PER INHABITANT, PARIS

Year	Total Population	Average per Inhabitant Rides	Expenses in Dollar
1861.....	1,696,741	56	\$3.53
1866.....	1,825,274	72	4.19
1876.....	1,988,806	99	5.18
1886.....	2,344,550	136	5.98
1891.....	2,424,705	155	6.56

The three decades from 1860 to 1890 were accompanied by an increase in population of about 50 per cent, with a rapid growth in all sections. The suburbs grew most rapidly, but in 1891 there were three sections in the center of the city with a population of nearly 400 to the acre.

We are now approaching the time of the construction of the Metropolitan subway, the electrification of the tramways and the use of automobile transport, which,

1870, and in three years had developed a traffic of 12,000,000 passengers, corresponding to 56 rides per inhabitant per year. Seventeen years later, or in 1887, the system was carrying more than 36,000,000 passengers annually, or an average for rides per inhabitant of 96. There had been an increase in density of population in the center of the city in the four sections mentioned of from 10 to 34 per cent, but by far the larger part of the additions to the population was in the suburbs. The latest figures (1924) from Buenos Aires show a population of 1,838,561, with 807 km. (504 miles) of tramway track and the number of passengers per year about 650,000,000.

RELATIONS BETWEEN THE INCREASE IN LAND VALUES AND RAILWAYS

Speakers at the 1910 convention in Brussels and at the 1912 convention at Christiania pointed out the close relation between railway development and land values, and especially the rapid increase with railroad extensions of values of land near the center of the city. Thus, a quarter of an acre at the corner of Madison and State Streets in Chicago, which sold in 1830 for \$20, changed hands in 1836 for \$25,000, in 1856 for \$45,000 and in 1894 for \$1,250,000. Somewhat similar figures could be cited from the experiences in many other large cities, made possible only because of transportation. As the creator of these values, the city should participate to some extent in this gain, as by the purchase of tracts in areas to be developed by new transportation lines, by assessments on real estate so improved or in some other way. Transportation extensions should also be made in a systematic way under government direction properly to develop the new territory.

In Paris these developments are under a city planning commission whose authority extends over all of the departments of the Seine, with powers to lay out streets, parks, sewer systems, water systems, extensions of existing transportation systems, etc., but the extent to which the transportation systems may be guaranteed against an operating deficit because of an unremunerative fare to develop these outside areas is still a debatable matter in France.

QUESTIONS OF SPEED AND CAPACITY

The close relation indicated between transportation and city development emphasizes the need of both speed and capacity in the transportation system. The actual rate of speed required by the cars varies with the circumstances. In a town of small area a moderate speed is adequate, but in a large city, with distant suburbs, the matter of speed becomes of the greatest importance. Mr. Jayot, in his thesis on city planning, has endeavored to give the rate necessary under different conditions. "Let us assume," he says, "in a city practically in the form of a circle, that the time of travel from the circumference to the center should be twenty minutes, of which fifteen minutes is spent on the transportation line and five minutes walking and waiting for cars, and that the density of population should not exceed 200 per hectaire (about 73 per acre). Then, by a simple calculation, the following conclusions are reached:

"Walking (at a speed of 2½ m.p.h.) becomes too slow when the city reaches a radius of more than ⅓ of a mile. This radius corresponds to a population of 60,000 inhabitants and some transportation system, either tramway or bus, is necessary. Such systems (with speeds of 7½ m.p.h.) should answer for cities until the radius

TABLE IV—PASSENGERS (IN MILLIONS) CARRIED IN LOCAL
TRANSPORT, PARIS

Year	Bus	Tramways	Subway
1911.....	135.7	426.4	428.8
1913.....	246.2	477.4	467.5
1915.....	*	396.6	405.9
1917.....	19.9	508.5	588.3
1919.....	95.4	589.9	726.6
1921.....	245.9	626.3	637.5
1923.....	337.5	682.3	704.8
1925.....	344.5	720.0	793.8

*Service largely discontinued because of war conditions.

beginning with 1900, had a decisive influence on the distribution of population, particularly the development of the suburbs. Recent statistics are shown in Table IV.

FIGURES FROM BUENOS AIRES

Somewhat similar results have followed the expansion of transportation systems in other cities. Thus, up to 1869, the city of Buenos Aires had no means of local public transport. It had a population of 177,787 with a density of population in four sections in the center of the city of about 173 inhabitants to the acre, while the density in the outer sections was less than one-tenth of this number.

The first street railway lines were put in operation in

reaches 2 miles, or corresponding to a population of not more than 600,000 inhabitants. Then faster transit is needed. Local subway lines (speed 15½ m.p.h.), with local stops, answer for cities up to a radius of 4½ miles, or with from 600,000 to 2,400,000 inhabitants. Express rapid transit lines with schedule speeds of 25 m.p.h. or more become necessary where the radius is 6½ miles and the population reaches 6,000,000."

With the speed between termini determined, the next question is how it may be obtained by different means of transit. Within cities it appears difficult to increase the speed of vehicles on the public streets. Actually in Paris the tramway lines have an average schedule speed

15½ m.p.h., although the stations are only about 1,640 ft. apart.

The Council of the Seine recently passed favorably on a proposed monorail system between Paris and St. Denis, a distance of about 2.1 miles, where it is expected that a speed of 50 m.p.h. can be made, or the run can be made in 3½ minutes, without any stops. The monorail will be about 50 ft. above ground, supported on columns 500 ft. apart. If constructed, it might throw some light on possible rapid transit lines of the future.

ADEQUATE CARRYING CAPACITY

The second condition mentioned was for the transport lines to be of a carrying capacity adequate to the needs, so far as can be done with economy in operation and first cost. Capacity, in turn, is dependent on both headway and capacity of the unit vehicle. Most of the companies replying to the questionnaire of the international association increase their capacity during rush hours by the use of trailers, although most of them admit that trailer operation reduces the speed. In Paris the carrying capacity of the motor car is 49 passengers and of the trail car 56. The motor buses in Paris have a capacity of 38 passengers if of the four-wheel type and 48 passengers if of the six-wheel type. A train of five cars on a Paris subway has a carrying capacity of more than 60 passengers per car.

The headway on individual street railway lines of heavy traffic in Paris is two minutes, reduced to one-half minute where several lines use a common trunk. On the bus lines the headway is one minute for lines separated and 25 seconds for lines using a common trunk. In consequence these lines have for tramways with trail cars an hourly capacity of about 3,600 people and the bus lines have about 2,500 people. The subway line has, during nineteen hours of the day, an average hourly capacity of 8,000 passengers, but during the rush hours this is considerably increased. The accompanying table gives some statistics on this speed and other data of a number of cities in western Europe.

Key System's Boat Launched

WITH appropriate ceremonies and in the presence of a notable throng, including city officials and men and women of prominence in the bay region, the new ferryboat *Peralta*, which is the first of two boats now being constructed by the Key System Transit Company, was formally launched at the Moore shipyards in Oakland, Cal., Oct. 14. The new craft will be ready for service about Jan. 1. The boats will be known as the *Peralta* and the *Yerba Buena*. *Peralta* is the name of an old Spanish family whose history is interwoven with that of the East Bay section. The family of Don Luis Maria Peralta was the first to settle in the East Bay. *Yerba Buena* was the name given by the Spanish to what is now the city of San Francisco.

There was another ferryboat known as the *Yerba Buena*, the first to be built for the Key System. This craft has now been sold, but its name will be given to the new boat, largely for sentimental reasons. The two new boats will be ready for launching in October and will be placed in service before the first of the year. Lines of a battleship have been followed in their construction, giving them a striking and solid appearance. Each will cost \$849,565. They were designed by Hibbs, McCauley & Smith.

TABLE V—ELECTRIC RAILWAY DATA FROM DIFFERENT CITIES IN 1925

City	Population Served, in Thousands	Passengers Carried Annually, in Millions	Annual Rides per Inhabitant	Average Number of Cars in Service	Average Capacity per Car, in Passengers	Average Schedule Speed	
						In Kilometers	In Miles
<i>Argentina</i>							
Buenos Aires.....	1,839	559.6	304	2,835	(e) 40-50	(c) 11	6.9
<i>Belgium</i>							
(ac) Brussels.....	900	224.5	249	111	45	12	7.5
<i>Czechoslovakia</i>							
Prague.....	720	173.5	240	438	45	12	7.5
<i>Denmark</i>							
Copenhagen.....	735	134.7	183	(d) 908	27-52	13	8.1
<i>France</i>							
Paris tramways..	4,568	1,065	407	(e) 4,298	(c) 47-56	(c) 11.5	7.2
Paris subways....		793.8	407	18.40	83-100		
(a) Lyons.....	1,000	181.8	182	741	35-76	12	7.5
(b) Lille-Roubaix..	650	50	77	149	46-100	12	7.5
(b) Marseilles.....	618.8	171	276	715	39-55	9	5.6
Bordeaux.....	407	95.2	233	386	42	10	6.2
Toulouse.....	250	46.4	185	178	40	9.8	8.1
(a) Strassburg.....	211.4	45.2	213	320	38-84	12	7.5
<i>Great Britain</i>							
(c) London.....		180		416	78	9.6	6.0
Glasgow.....	1,433	460.7	325	1,086	62	15	9.3
Leeds.....	558.5	144.8	259	284	70	12.8	8.0
<i>Holland</i>							
(a) Amsterdam.....	712.2	129.4	181	(f) 568	26-50	12.2	7.5
Rotterdam.....	601.8	60.0	99	236	35-70	13.5	8.4
<i>Italy</i>							
Turin.....	500	190	380	530	45	12	7.5
<i>Norway</i>							
Oslo.....	320	85.0	265	230	44-86	10.8	6.8
<i>Poland</i>							
Warsaw.....	992.4	220.5	222	431	52	12	7.5
Posen.....	218	23.6	107	112	44	11.7	7.3
<i>Spain</i>							
Barcelona.....	1,000	238.7	238	630	38-90	10	6.2
<i>Sweden</i>							
Stockholm.....	440	119.0	270	500	55	12	7.5
Göteborg.....	251	65.0	258	(g) 299	48	13	8.1
<i>Switzerland</i>							
(a) Zurich.....	205.5	52.2	254	290	40	15	9.3
Basle.....		34.0		204	40	15	9.3
Geneva.....	163	18.9	116	112	34-58	13	8.1

(a) figures are for 1924.

(b) an interurban line.

(c) figures relate to tramways only.

(d) of which twelve are motor buses.

(e) of which 1,368 are motor buses.

(f) of which eleven are motor buses.

(g) of which nine are motor buses.

of about 7.2 m.p.h., with a maximum of 9.4 m.p.h. and a minimum of 5 m.p.h. Motor bus lines make an average schedule speed of 8.4 m.p.h., a maximum of 15.5 m.p.h. and a minimum of 6.4 m.p.h. The figures received by the international association from a questionnaire from various cities in Europe and the Argentine give about the same rates of speed, as shown in Table V. By the use of express buses, such as were put in service on a few lines in Paris in 1925, scheduled to make a minimum number of stops, a considerable gain over the figures mentioned above have been secured, but the amount of such service installed has been limited because the gain in time on most routes has not made the service worth while. In Paris the average distance between stopping points for passengers for both buses and tramways is 375 m. (1,230 ft.).

On the Paris subways the average schedule speed is

North Shore Uses New Equipment for Dispatch Freight

AN INNOVATION in the handling of less than carload lots of freight will feature this phase of service on the Chicago, North Shore & Milwaukee Railroad as flat-car and trailer equipment specially designed for the North Shore line is placed in regular operation between Chicago and Milwaukee.

This is the first equipment of its kind to be used on any railroad in the United States. It differs from equipment somewhat similar in nature in that the automotive trailers are mounted on the flat cars without the wheels being removed. Special runways are provided whereby two trailers are mounted on each flat car. Interlocking devices hold the trailers securely in place during rail transit.

The trailers eliminate all extra handling of shipments, since they are loaded at the point of departure and unloaded at their destination. After being loaded they will be hauled by motor truck to a central point where they will be mounted on flat cars. Deliveries of the trailers will be made in similar manner to all parts of the cities served by this new type of equipment.

Since the North Shore trains enter Chicago over the elevated tracks of the Chicago Rapid Transit it is not feasible to provide freight car facilities in downtown Chicago. This form of pick up and delivery is practically a necessity to successful operation. For some years it has been the custom to pick up and deliver freight in automotive equipment and transfer it to rail cars at the southern end of the surface section of the North Shore. This required double handling at these terminals and the consequent checking. This equipment will therefore avoid the extra handling of merchandise.

The first of the order of flat cars and trailers has already been delivered, and the balance of the order is scheduled for delivery by the middle of November.



One of the Rail Car Trailers Used on the North Shore for Holding Two Steel Box Automotive Trailers Used in Shipping Dispatch Freight between Chicago and Milwaukee

New chassis also have been ordered to convert trailers now in use to the interlocking type.

The trailers are of 8-ton capacity each, with 7x17-ft. metal container bodies manufactured by the Trailmobile Company of Cincinnati, Ohio.

Car Heater to Utilize Motor Rheostat Losses

AN ELECTRIC heater, designed to utilize the energy usually wasted in motor rheostats, has been installed on one of the cars of the United Railways & Electric Company of Baltimore. Patents to cover it have been applied for in the name of the company's engineers, who conceived the idea. The heaters are beneath the seats and can be grouped in any desired manner to possess approximately the same ohmic resist-



New North Shore Merchandising Equipment Consisting of Two Steel-Box, Rubber-Tired Trailers that Can Be Shipped Intact on Their Own Wheels on a Special Flat Car. The Trailer Units Are Built by the Trailmobile Company



One Car in Baltimore Is Equipped with Heaters Which Utilize the Energy Usually Dissipated in Motor Rheostats. In Warm Weather They Can Be Put Out of the Circuit in Whole or in Part

ance as the exteriorly located rheostat. Means are also provided whereby the exterior rheostat or resistance may be used selectively, depending upon the season of the year or the temperature. This selection is made by a simple switch or control device, easily operated by the motorman or conductor and necessitates no change in the wiring of the controller or other parts of the car, aside from certain additions. The heaters can be grounded in the case of a short circuit.

As shown in the illustration, the heaters are arranged to replace the ordinary foot rest. Later designs are provided with guards so that passengers will not come into direct contact with the heater cases.

Operator's Name Carried on Fare Box

CAR operators of the El Paso Electric Company are known to the passengers by name. After experimenting with various methods of posting the operator's name for the benefit of the passengers, such as placing a nameplate in the vestibule or on the bulkhead, the company has selected the side of the fare box as the most satisfactory location. The operator's name is stamped on an aluminum nameplate which fits into a slot on the side of the fare box. The letters are raised while the background is painted blue. These plates are light and compact, being no larger than a pocket comb, and are easily carried in the trip-sheet holder. One operator's plate is removed and that of his



To Personalize Its Railway Service the El Paso Electric Company Places Each Operator's Name on the Fare Box of His Car

relief inserted at the time register readings are taken, thereby making it unlikely to forget to make the change. Another advantage of this location is that in changing ends the name, being attached to the fare box, is always changed. Moreover, the visibility of this location is particularly good.

Track Shift Relieves Traffic Congestion

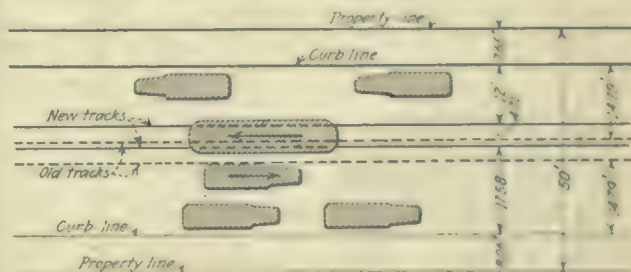
Location of Single Track Slightly Off Center on Narrow Street Gives Room for Double Line of Vehicles on Left and Single Line on Right

BY SHIFTING its track on Acushnet Avenue 2.79 ft. away from the center of the street the Union Street Railway, New Bedford, Mass., has made a substantial contribution to the relief of traffic congestion. Formerly with the car tracks in the center of the street it was impossible on account of vehicles parked along the curbs for a moving automobile to pass on either side of a street car. With the tracks offset it is now possible for an automobile to pass on the east side and many annoying delays have thereby been eliminated.

Acushnet Avenue is a north and south business street with stores on both sides. Its width from property line to property line is 50 ft. Approximately 8 ft. is taken on each side of the street for a sidewalk, leaving 34



Southbound Car on Offset Tracks Passing Northbound Automobile Without Interference



Track on Acushnet Avenue, New Bedford, Mass., Has Been Shifted 2.79 Ft. to One Side, Giving a Clear Roadway of More than 15 Ft. Between a Car and the Curb on the Left-Hand Side

ft. for vehicular roadway. With a 9-ft. car in the center of the street the clear roadway on each side was only approximately 12½ ft. This was insufficient for a moving automobile to pass between a parked machine and a car. When an automobile was moving in a direction opposite to that of a car, considerable maneuvering was necessary before the passage could be arranged.

On this street the cars operate in a southerly direction only and the tracks have now been moved 2.79 ft. off center toward the right, or west side. This gives a clear space on the left or east side of slightly more than 15 ft. between the car and the curb, sufficient for one line of parked automobiles and one moving line. Thus under the present arrangement northbound automobiles move freely on this side of the street. Southbound automobiles must travel behind southbound street cars. The offset continues for a distance of fourteen blocks or a total of 3,579 ft.

Maintenance Notes

Kerosene Preheaters Make Possible Asphalt Work in Cold Weather

KEROSENE - BURNING preheaters constructed in the local shops of the Northern Texas Traction Company, Fort Worth, Tex., have been used with success in emergency patch paving of asphalt. Necessity in this case was the mother of invention. A street was repaved by this company last winter and the asphalt torn out while the weather was fine, but when the new asphalt was to be replaced a day or so later the weather had turned cold and rainy. By the use of the preheaters the old asphalt was dried out and heated so that the new asphalt coated rock could be properly worked.

The preheater consists of a 2x6-in. burner tube and 3-in. air pipe with cutoff valve that connects the burner tube to the air compressor. A 3-in. fuel pipe and flexible hose extends to the kerosene supply. The heater is arranged with a staff so that it can be held in position and directed at one point.

Los Angeles Railway Finds Pit Grinder Saves Time

IN A recent trial of a new pit grinder just installed in the shop of the Los Angeles Railway a pair of wheels were ground and put back into service in one hour and 35 minutes. The same operation would have required several hours with the former method of grinding wheels in vogue in this shop.

The grinder is installed in the pit below the tracks and is driven by a 20-hp. electric motor. When flat wheels are detected the car is pulled over the center of the grinding wheels and a pair of screw jacks with the bases resting on the platform are placed so as to lift the truck and car body so that the wheels will be normally about 1 in. above the rail. Gap rails in the track are then removed and the grinding wheel is brought into position by means of a screw. The car wheels are revolved by the motors geared to them.

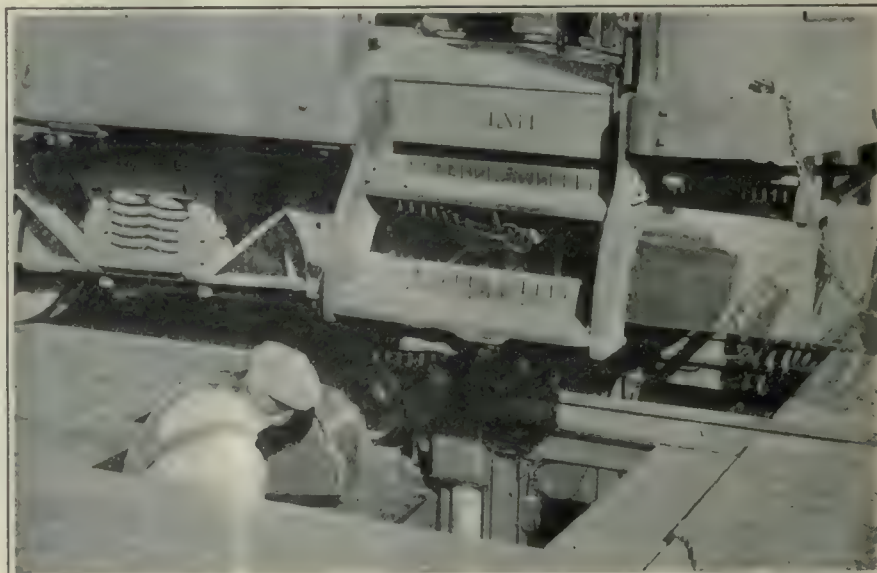


Preheaters Made by Northern Texas Traction Shown in Use on a Street in Fort Worth. These Burners Make It Possible to Work with Asphalt Coated Rock During Wet and Cold Weather

The machine is double-ended so that two wheels can be ground at the same time. The rotating of the wheels is cut down to the desired speed by a special combination of resistor units. The grinder is equipped with a fan which exhausts, through a system of pipes, dust and particles of metal detached in the grinding process. These are forced into a receiving chamber. After the

wheels are ground the gap rails are replaced and the jacks lowered until the wheels rest on the tracks so that the car can be rolled away.

Where it is necessary to grind the wheels on trailer axles which are not equipped with motors the axle is driven by a special arrangement of pulleys, gears and sprockets which have been designed by the staff of the mechanical engineer of the rail-



Grinding a Pair of Wheels with the New Pit Grinder in the Shop of the Los Angeles Railway

way. Previous to the installation of this grinder, wheels had to be removed from the truck and brought to a stationary grinder for truing up. This operation was slow, tedious and expensive. Increased traffic made it necessary to use some other means and the pit grinder is the result.

Your "Rough Riders" are dangerous, uncomfortable and unprofitable. Eliminate them by improved maintenance.

Stop on Coil-Straightening Vise Saves Workman's Time

IN REWINDING railway motor armatures which have strap wound coils it is the usual practice of electric railways to strip off the old insulation and reinsulate the coil. After the old insulation has been removed an important part of the preparation of the bare copper part is to straighten it in a vise before reinsulating. Owing to the shallowness of the vise jaws, the placing of a coil in the proper position for straightening may consume considerable time.

In order to provide an easy method of aligning the coil in the straightening vise, the Brooklyn-Manhattan Transit Corporation, in its department of electrical repairs, has its straightening vises provided with curved clips which extend underneath



Curved Clip Underneath Jaws of Straightening Vise Enables the Workman to Place Armature Coils in Position for Straightening Without Difficulty

the full width of the jaws when they are open. The accompanying illustration shows the construction. A and B are the two jaws of the vise and C is the curved clip which extends underneath. This clip does not interfere with the movement of the jaws, but acts as a stop so that the coil can be dropped into position quickly.

The usual operation is for the workman to open the jaws sufficiently so as to receive the coil and with one hand he drops the coil into position, while with the other he operates the vise handle to squeeze out any kinks from the coil leads. The curved clip eliminates trouble of alignment and a little experience enables the workman to straighten coils rapidly.

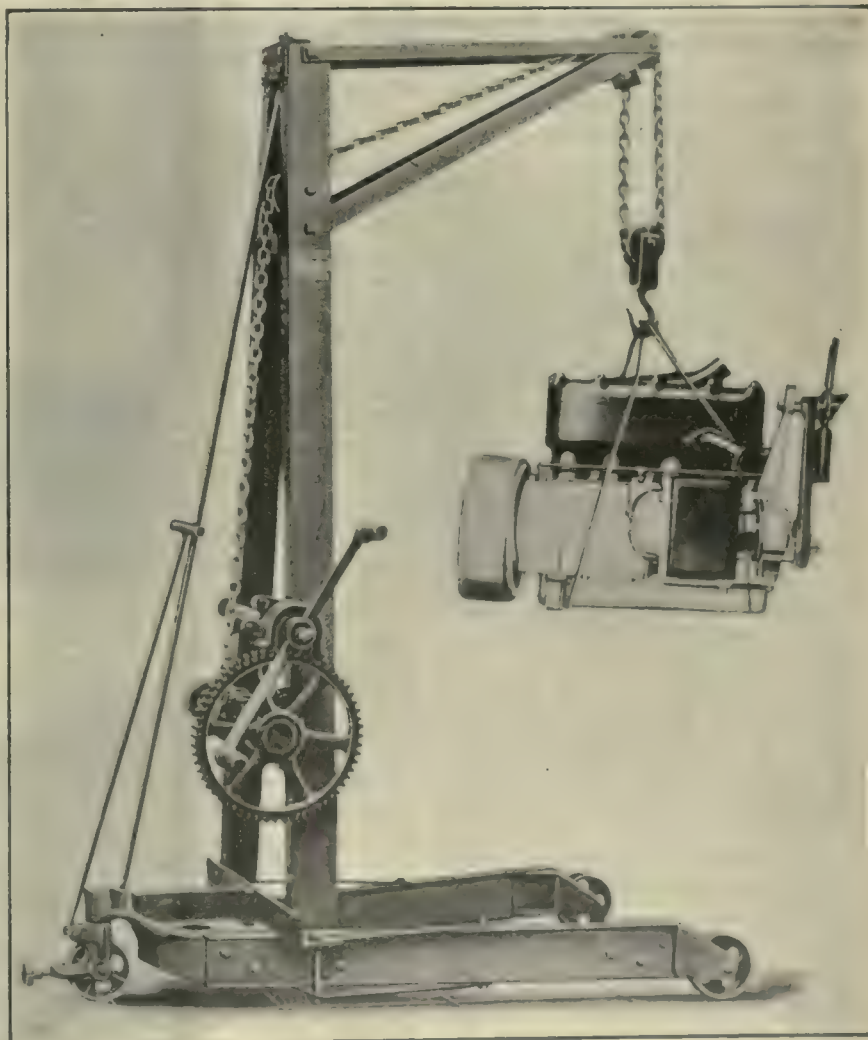
New Equipment Available

High-Lift, Deep-Overhang Floor Crane

WHERE shops are not provided with overhead cranes or some type of overhead traveling hoist, portable floor cranes are a convenient accessory. Heavy parts can be removed directly from cars and transported to workbenches for overhauling by one man without much exertion. In order to provide a floor crane which is light and which at the same time has high lift, deep overhang and a low base, the Manley Manufacturing Company, York, Pa., has brought out a new type. Different styles of this crane provide for a lift from the floor varying from 6 to 7½ ft. and with an over-

hang varying from 30 to 38 in. The weights of the cranes range from 300 to 770 lb. The base is constructed so that it may be run under a car body or motor car. The structure is on the cantilever bridge principle. The base is a combination of steel and heavy I-beams. With the heavy base and light superstructure the center of gravity is low. The light superstructure also makes it possible to have a deeper overhang with a higher lift and a lower base than would otherwise be possible unless danger of the cranes becoming topheavy resulted. The operating handle provides a leverage of 12 to 1 when in its center position and the handle may be pulled through a slot to its extreme length so as to double the leverage ratio, making it 24 to 1. A steel drum is provided for the chain so that it will not crowd or slip down from one convolution to another.

The wheels have wide faces and are fitted with roller bearings so that



Crane of One-Ton Capacity for Handling Equipment of Passenger Cars and Light Trucks. It Has a 7-Ft. Lift and 35-In. Overhang

transportation of heavy equipment can be carried out easily by one man. A small wheel is provided in the center at one end for steering. This can be locked to make the crane immovable while it is being loaded or unloaded. For bus overhauling the crane can be used instead of an incline for raising one end of the bus while working under the chassis. There are no thrust bearings, worm wheels or complicated parts to cause trouble.

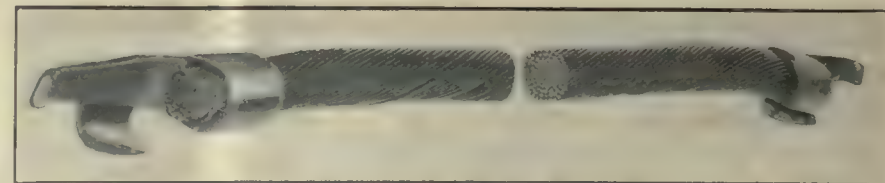
New Features in Line Switch Equipment

IMPROVEMENT in operation and decrease of need for maintenance are accomplishments claimed for new line switch equipment for type K control brought out by the Westinghouse Electric & Manufacturing Company. There are three new major pieces of equipment, a type UM-2-A magnetic line switch, a TC-2 control and reset switch and a TA handle switch, connected to a type K controller, all of which embody many features not included in older equipment.

The new equipment does not affect the present standard scheme of connections. It can be installed in place of the present line switch equipment without changing the cables on the car. The line switch is a lightweight unit especially designed to prevent freezing of contacts and false opening or closing. The blow-out and arcing parts are designed to handle heavy overloads and short circuits quickly and effectively. An air trip cylinder is also provided for use with standard type of control safety devices.

The control and reset switch is much lighter and the mechanism is more accessible than the older type. It is equipped with a blow-out arrangement that eliminates the necessity of a blow-out coil, which in the older type switches was the source of annoyance because of the space it occupied and danger of open circuits. The switch is inclosed in a black molded Moldarta box with a hinged cover. All parts are easily accessible.

The handle switch takes the place of the ratchet switch, with more satisfactory results. It is mounted on the top plate of the controller instead of at the bottom as in the ratchet switch. By inclusion of a certain amount of lost motion between the main operating handle and the main drum shaft provision has



This Arcon "F" Bond May Be Applied to the Rail Base

been made for a set of make and break control contacts. This lost motion insures the breaking of the circuit to the operating coil of the line switch before the main drum starts to move to the "off" position. This eliminates arcing and burning of the controller. No change is involved if the safety control devices are applied on top of the handle. The over-all height of the controller with the TA handle switch is no greater than with the standard handle.

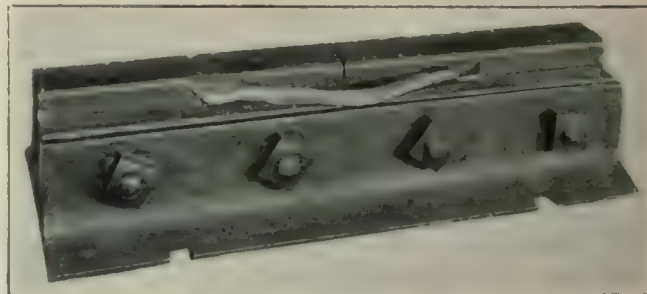
Three Types of Rail Bonds

COMplete absence of metallic pockets which interfere with the welding arc is claimed for three new types of rail bonds being manufactured by the American Steel & Wire Company of Chicago, Ill. These are known as Arcon bonds and are for application by the copper metallic arc welding process.

The first of these is the Arcon "A" bond, which is a U-shaped steel terminal bond for application to the rail head. Designed to provide a free and open welding space the steel terminals tilt the bond to clear the splice bars. The heavy steel lugs retain the welding metal and the metal can be built on a slope to the top of the rail to deflect wagon wheels and similar foreign objects. The strand is positioned in the terminals to insure a homogeneous weld between the strand ends and the head of the rail with easy arc manipulation. A seamless steel sleeve dampens and absorbs vibratory stresses in the strands and protects it from the heat of the arc.

A special design was worked out for the Arcon "C" rail bond with the idea in mind of its application to the rail head when a Weber joint is used. The steel terminal design is such that all parts of the terminal rail and conductor are accessible for welding. A low resistance all copper connection is easily and quickly accomplished. Accompanying illustrations show both "A" and "C" bonds actually applied to rail joints.

If it is desired to apply the bond to the rail base around the splice bar the Arcon "F" bond may be used. The steel terminal is designed to co-act with the angle of the rail flange to retain the welding metal. In this long flexible bond complete fusion between the strand ends and the rail base is accomplished with a minimum amount of welding electrode. All unnecessary retaining walls have been eliminated so as to permit easy penetration by the welding arc. A heavy hook is provided to hold the bond in place preparatory to welding. This hook is so designed that it will fit easily between rail and tie.



Arcon "C" Bond Is Designed for Use with Weber Joints



Arcon "A" Bond Applied to Rail Head

Association News & Discussions

Motor Carrier Regulation Considered

Railroad and Utilities Commissioners Discuss Important Phases of Transportation at 38th Annual Convention in Asheville, N. C.—Factors in Bus and Truck Control for Interstate Service a Leading Topic

Editor's Note—That the industry may be informed, in this issue is published a telegraphic report of the proceedings of the annual meeting of the National Association of Railroad and Utilities Commissioners held in Asheville, N. C., Nov. 9-12.

This report contains a synopsis of committee reports of interest to the electric railway industry. Discussion of interstate bus regulation, uniform bus accounts, service and fares of electric railways are included. In next week's issue will be published extracts from these reports in more detail.

The trend of thought in the minds of state regulatory authorities is of vital interest to every utility. The JOURNAL has covered the meeting for the electric railway industry in order that this information may be available promptly.

REPRESENTATIVES from the Public Utilities Commissions or similar regulatory bodies of some 30 states met in Asheville, N. C., Nov. 9 to 12 for the 38th annual convention of the National Association of Railroad and Utilities Commissioners.

Several subjects of interest to electric railway men were included in the reports presented by standing committees and in addresses delivered during the meeting. Regulatory problems connected with the operation of motor vehicles were given an important place on the program and occupied a considerable part of an entire day's session. President A. G. Patterson, chairman of the Alabama Commission, in his opening address outlined a number of factors connected with the motor vehicle subject. His view was that existing state authorities should be employed as the agencies by which regulation, both intrastate and interstate, should be carried out. He also expressed the view that "in devising such legislation the rights and interests of existing carriers by rail or by boat should of course not be ignored." A more complete extract from Mr. Patterson's address relating to this subject will be printed next week.

In discussing common carrier rates the president made a strong plea in favor of checking the tendency since the war for the encroachment of federal upon state authority in regulation. A similar view with respect to the extension of federal authority was expressed by many speakers during the convention, including Commissioner J. J. Esch of the Interstate Commerce Commission. This latter view was contained in an address the subject of which was the commerce clause of the American Constitution.

Further reference to the matter of automotive regulation was made in the reports of the committees on state and federal regulation, motor vehicle transportation, express and other contract carriers, and by the special committee

on motor vehicle legislation. C. C. McChord, counsel of the National Automobile Chamber of Commerce, discussed the interstate regulation of motor vehicles from the automotive viewpoint. A brief outline of the position taken by the Motor Bus Division of the American Automobile Association in preparing a bus regulatory bill for presentation to Congress was given by S. M. Markell, attorney for the automotive interests. Mr. Markell urged the expediency of concentrating effort on the passage of interstate bus regulatory legislation independent of truck regulation on the ground that such action involves no recession from the principle that both bus and truck transportation should be regulated. He pointed out that opposition to truck regulation is more determined than that to bus regulation, and that the problems presented by the truck are considerably more complicated than those involving the bus.

A decided difference of opinion arose in the discussion. Commissioner Ivan Bowen of Minnesota voiced strong opposition to any federal legislation on the subject on the ground that this would be another step toward extension of federal authority and also that it is highly desirable to insure the development of a competitive form of transportation, which he claimed would help hold freight rates to a minimum. Although Minnesota commissioners were alone in this extreme position there was considerable difference of opinion regarding the matter of advocating bus legislation separate from the control of trucks. The question was finally disposed of by a resolution leaving in the hands of the committees on motor vehicle transportation, motor vehicle legislation, and state and federal legislation the power to carry on the work of supporting legislation before Congress looking to the regulation of automotive vehicles in interstate commerce.

The committee on statistics and accounts of public utility companies indorsed the classifications for bus companies with annual operating revenues of more than \$100,000 and those with operating revenues of less than \$100,000 adopted by the American Electric Railway Association.

In the report of the committee on service of public utility companies of which J. F. Bell, lieutenant-colonel, Corps of Engineers, United States Army, was chairman, a strong statement was made in favor of giving more consideration to good service than to cheap fares in the regulation of electric railways. Extracts from this report will be published in next week's issue of the JOURNAL. Indorsement of the recommendation of the National Conference of Street and Highway Safety regarding the establishment of automobile stops at dangerous railroad crossings is contained in the report of the committee on safety of railroad operation. Experience in Minnesota, where such a law is in effect, is presented to show the reduction in accidents and fatalities that has resulted.

A strong indorsement of the indeterminate form of utility franchise was carried in a resolution presented by Commissioner Esch of Wisconsin.

Addresses were delivered during the convention by Joseph B. Eastman, chairman Interstate Commerce Commission; John H. Small, chairman Rivers and Harbors Congress; John J. Esch, Interstate Commerce Commission; M. H. Aylesworth, president National Broadcasting Company; Alexander Forward, secretary-manager American Gas Association; Carl D. Jackson, member American Bar Association committee on uniform regulatory law. Short discussions of relations with the regulatory commissions were made by representatives of

COMING MEETINGS

OF

Electric Railway and Allied Associations

Nov. 16-18—Society of Automotive Engineers, National Transportation and Service Meeting, Boston, Mass.

Nov. 17-18—Iowa Electric Railway Association, operating and maintenance section, annual convention, Fontanelle Hotel, Omaha, Neb.

Nov. 17-18—Central Electric Traffic Association, regular meeting, Fort Wayne, Ind., Keenan Hotel, 9 a. m.

Nov. 19—New York Railroad Club—annual meeting, Engineering Societies Building, New York City, 8 p. m.

Dec. 3—American Electric Railway Association, Metropolitan Section, Engineering Societies Building, New York City, 8 p. m.

Dec. 6-9—American Society of Mechanical Engineers, annual meeting, New York City, Engineering Societies Building.

Jan. 25—New York Electric Railway Association, winter meeting, Hotel Commodore, New York City.

Feb. 3-4—Central Electric Railway Association, winter meeting, Toledo, O., Commodore Perry Hotel.

several public utility associations and companies.

John F. Shaughnessy, chairman Nevada Public Utilities Commission, was elected president for the ensuing year. Other officers elected were Henry G. Wells, Massachusetts, first vice-president; Lewis E. Gettle, Wisconsin, second vice-president, and James B. Walker, New York, secretary.

The next meeting of the association will be held during the third week in October, 1927, at Dallas, Tex.

American Association News

Public Not Interested in Railway Troubles

STRAIGHT from the shoulder talks Sby C. S. Ching, supervisor of industrial relations United States Rubber Company, and Walter Drey, vice-president and general manager *Forbes Magazine*, advising electric railway men to stop telling the public their troubles and to begin advertising their accomplishments, were the features of a meeting of the Metropolitan Section,

A.E.R.A., held in the Engineering Societies Building, New York City, Nov. 5. Abstracts of the outspoken comments of these speakers appear elsewhere in this issue.

High spots of the recent Cleveland convention were outlined in a short talk by Guy C. Hecker. He quoted figures showing the amount of space used for the exhibits and spoke of the unusual interest displayed by the public. The proceedings of the various affiliated associations were briefly summarized for the benefit of those who had been unable to attend the convention.

A. L. Hodges presented the report of the secretary and stated that the membership of the Metropolitan Section is now 1,164. The report of the treasurer was also read by Mr. Hodges. Following the talks by Mr. Ching and Mr. Drey, officers were elected for the coming year. The program was concluded with several excellent entertainment features.

The new officers are: President, T. R. Langan; first vice-president, R. F. Carbutt; second vice-president, P. W. J. Smith; third vice-president, C. F. Scott; secretary, A. L. Hodges; treasurer, George H. Ord. Three new members were elected to the executive committee one more than usual owing to the election of C. F. Scott to a vice-presidency. The new members are J. F. Lamb, W. G. Straight and W. J. Stanton.

Railway Outlook Has Changed*

To Furnish Local Transportation Regardless of the Type of Vehicle Is the Duty of the Industry—Public Favor Must Be Wooed, Not Taken for Granted

BY WALTER DREY

Vice-President and General Manager *Forbes Magazine*

DESPITE the fact that a newspaper man if he were charged with the responsibility of running a railway couldn't meet the problems half as well as you meet them, yet he feels perfectly justified in criticising the work that you are doing. When you are in a public service business—and it isn't purely a burden that faces you as transportation men, because it faces every other public utility—it is not merely a problem of delivering 100 per cent service, whatever the conditions may be. After you have delivered such service you have got to be constantly telling that public such service as you have delivered to them is 100 per cent.

The reason why a transportation company must use advertising in order to maintain its public relations in the proper fashion is this: We people in the newspaper business are concerned with news, and you only reach or get into the news columns when something happens that is news. When a man does what he is expected to do, that is not news. In other words, if a man leads a decent, exemplary life and goes home to his family every night and raises his children as they should be raised, he can live that way from the cradle to the grave and he probably will never see the front page of a newspaper. But let that same man run

off with another's man wife, or let that man do something outside of what he is expected to do, and he immediately becomes "news" and his activities have to be reported.

By the same token, when anything goes wrong on the railway, that is news and will find its way into the newspaper columns. When everything goes right on the railway that isn't news. That is just what you are expected to do, and you don't see the light of day as far as the news columns are concerned. It therefore becomes the job of the transportation company to tell the story of the operations in the form of advertising, to capitalize every possible resource that you have in telling your own story.

One of the chief problems today in public relations is to establish in the minds of the public the idea that you are at least trying to do the right thing, regardless of the lapses you have, because whatever you do will never be perfect. When you once do that, you will get an entirely different attitude with your public and with your community. When once I am fundamentally convinced that the man who is serving me is trying to do the right thing, I will excuse a lot of lack of service, whether it is my butcher, my baker, or my candlestick maker. When I get the idea that the man I am trading with is not trying to do the right thing, even though he gives me what

appears to be 100 per cent service, I am still suspicious of him. He loses my trade regardless of the quality of the goods or the perfection of the service that he performs.

My mind goes back to the time of a meeting of the American Electric Railway Association three or four years ago at Washington. For the previous five years the electric railway industry as a whole hadn't been sure of its own future. Then a brand-new idea took hold of the men in this business, because suddenly the realization came that they weren't in the electric railway business at all, that they were in the transportation business, that the transportation business was essentially a controlled monopoly, that it didn't make a bit of difference whether the vehicle was propelled by gas, by gasoline engine, or by electric motor, or what-not, that the business of this industry was to haul the greatest number of people in the most comfortable way at a fair profit to themselves. The moment that thought took hold, it marked the rise of a new day, and it marked an epoch so that the people who were identified with the industry once more saw opportunity and a chance to be rewarded for the service that they performed.

That is where the electric railway industry stands today in the public mind. We don't think of you as operating any particular type of vehicle, but we do hold you responsible to give us the very best service that it is possible for you to give under any given conditions.

To my mind, the hardest pill that any group of men had to swallow was that which transportation men took when they accepted the bus. When a man has been trained for years to believe in the supremacy of electric power to meet any and all conditions under any and all circumstances, by the time he reaches middle age it is difficult suddenly to realize that mechanical development has created a situation where the thing which he thought was omnipotent has limitations. It is a tough pill to swallow. It was a very, very difficult thing for the traction men to take, but they took it like men.

Electric railway conventions today are no more like the conventions of three years ago in morale, in spirit, in attitude, than day is like night. That condition has been brought about within the last two or three years. One other thing remains to be done. You have got to tell the public your story.

It is like this: A fellow goes out to court a girl and he woos her. When he woos her he is constantly putting his best foot forward. Then he marries her. After that he may continue wooing her for a year or two, and then comes that stage of take-it-for-granted—you are here, and I am here, and everything is all right. The street railway industry was married to the public for 25 years, and after that they came mighty close to getting a divorce. Then came the realization that a new courtship had to be started, that the industry had to woo the public all over again. Now you have started wooing and you have won your public once more, don't take your public for granted. Continue to woo the public as long as you are on the job.

*Abstract of a talk given at a meeting of the Metropolitan Section, A.E.R.A., New York, N. Y., Nov. 5, 1926.

The News of the Industry

Hearings Begun in Kansas City

Start Is Made on the Discussion of Questions Involved in Settlement of Franchise Extension Matter

At last week's meeting of the special committee of the City Council of Kansas City, Mo., appointed to negotiate with the Kansas City Public Service Company in devising provisions for a new street railway franchise it was decided to hold two night meetings or hearings each week following the next scheduled meeting, set for Nov. 10.

DEAN'S STATEMENT INTERPRETED

The statements made two weeks previously before the Council committee by Dean H. E. Riggs of the University of Michigan, in connection with valuation figures he had set upon the local properties for the federal court, were again discussed at the Council franchise hearing last Thursday afternoon. Both Mayor Beach and Councilman Henry L. McCune interpreted the statements to be that Professor Riggs meant that the valuation of the property in its present condition should be about \$18,000,000, but after the projected rehabilitation program is completed the property should be evaluated at approximately \$25,000,000.

The dean's statements were read before the meeting, and it was pointed out that he had said, "after the property has been put in good shape to operate, it ought to be allowed earnings on a capitalization of \$25,000,000."

Judge McCune also referred to the valuation of \$18,000,000 mentioned in Dean Riggs' report to the federal court, in which he also stated that about \$7,000,000 would be required to rehabilitate the property; the Judge contended these references tended to bear out the fairness of the proposed valuation figure of \$18,000,000.

PRESIDENT STATES HIS CASE

William G. Woolfolk, president of the company, said he was of the opinion that his company could not accept a valuation as low as \$18,000,000. In explanation, he cited the Interstate Commerce Commission's ruling that when a property is purchased at a low price all expenditures for rehabilitation must go into the capital account of the operators. Mr. Woolfolk also expressed the belief that Dean Riggs had said the property had a valuation of \$25,000,000 on Jan. 1, 1925, which definite statement appeared at one point in the dean's recent testimony, in answer to a direct question.

In speaking of fares in connection with the probable earnings of the company, Mr. Woolfolk made the following statement before the committee:

Kansas City cannot expect for some time to get a lower rate of fare than that pro-

vided for in the extension franchise. We believe that in a new franchise valuation provision should be made for cost of materials and supplies getting lower; this would reduce expenses and could be used to lower fares.

For several years we do not expect to earn much above operating expenses. Provision should be made so we could earn \$2,000,000 to \$2,500,000. In five years the receivers averaged \$1,934,108 a year. With conservative and economic operation we know we can do better than that. With necessary improvements and new equipment, we believe the road in a few years will be able to earn \$2,500,000 a year.

We would be glad to see the present ordinance stand, if we could earn 6 per cent on the valuation it permits. Taking the original valuation of \$25,000,000 and bringing it down to date by adding to it the cost of permanent improvements as soon as permitted by its provisions, we would be permitted to earn 6 per cent on a valuation of \$43,000,000. But we know that could not be done.

We want a franchise which will permit the company to earn a fair return on the present rates of fare; also any new money which may be put into it, other than maintenance and repairs.

In his testimony last month Dean Riggs recommended 8 per cent as a fair return for a public utility, which he said would leave 2 per cent for depreciation, or for amortization at the end of a 50-year period.

The Council committee has asked Fred W. Fleming and Francis M. Wilson, until recently receivers of the property, and E. M. Stayton, city member of the board of control of the company, to testify at the next hearing.

Planning Board Agrees with Boston Elevated

In the pending discussion between the Boston Elevated Railway and the Mayor of Boston over the construction of a subway under Governor Square, so as to eliminate some of the traffic congestion on the surface, the Elevated scores through a new proposition which comes from the Metropolitan Planning Division. It would cost about \$5,000,000 to build the subway, on which the Elevated company would have to pay the rental, but it would cost only about \$1,400,000 to carry out the suggestions of the Planning Division. This plan would lift Beacon Street traffic over Commonwealth Avenue so as to eliminate both trolley and auto congestion in the street; there would be no crossings of lines. There would be a ramped viaduct, ornamental in design, a sort of two-level highway overpass from Commonwealth Avenue to Beacon Street.

While this is only a suggestion, it is important because it comes from a body which two years ago advocated a subway at this point. Today the Planning Division says that it is a serious matter to suggest that the car riders of Boston assume an added burden of several million dollars which they would have to pay for the cost of the subway. The proposed viaduct would not interfere with any future extension of the subway in Commonwealth Avenue, Beacon Street or Brookline Avenue.

Another Chicago Snare Ahead

Sectional Favoritism Basis for Opposition Which Blocks Appointment of Citizens' Traction Committee

The plan to appoint a citizens' advisory committee on Chicago traction matters, which was drafted and approved by the local transportation committee of the City Council, went awry on Nov. 4 when it was ensnared in a sectional battle in the Council.

Seven prominent Chicago business men were to have been appointed to the committee at that time by the City Council. The names proposed for the committee were James Simpson, Rufus L. Dawes, George Woodruff, Patrick Nash, Stuyvesant Peabody, John Hayes and George F. Nixon.

After several hours of debate, it developed that the principal objections to the plan was that Loop interests were being favored to the detriment of outlying wards. Mayor Dever's message to the City Council on the previous day, in which he urged that immediate steps be taken toward construction of a downtown subway system, paid for by special assessment and the city's traction fund, was also cited as further indication of this sectional favoritism. It is now considered unlikely that the proposal will again be brought up for discussion for another two or three weeks.

ASSESSMENT PLAN ADVOCATED

That there would be serious trouble ahead for any such plan as contained in the report of the citizens' subway commission, which was presented last August to the City Council (see ELECTRIC RAILWAY JOURNAL for Aug. 28) and which served as a basis for the recommendations in Mayor Dever's recent message to the Aldermen, was likewise made evident at the meeting of the local transportation committee.

One of its most bitter opponents was Alderman John Toman, who stated that he would fight the plan when it comes up for consideration on Nov. 16 because it permits only 35 per cent of the cost of subways to be assessed from property owners. He especially resented the suggestion to take moneys from the city's \$45,000,000 traction fund for this purpose. He said:

The special assessment ought to be for at least 75 per cent of the cost of the subways. Daniel L. Turner, consulting engineer of the New York subway commission, said in a report three years ago that subways increased the value of property 75 per cent. It has been shown that the subways in Manhattan boosted values seven times and in the Bronx 34 times. Take the Michigan Avenue link bridge right here in Chicago, costing \$14,800,000. The plan commission showed two years ago that the bridge had increased property values \$50,000,000. The figure is now probably more than \$100,000,000. Property owners should certainly pay more than 35 per cent of the cost.

Denver Tramway Case in Supreme Court

City Attorney Henry E. May and Assistant City Attorney Thomas H. Gibson of Denver, Col., on Nov. 5 presented to the United States Supreme Court a petition in which they seek reversal of the decisions of Federal Judge Robert E. Lewis in favor of the Denver Tramway. Among other things they contend:

The trial court was without jurisdiction. The franchise is a contract between the people of Denver and the company. The franchise stipulates a 5-cent fare. The federal court cannot set aside the 5-cent fare provision of the franchise because the question of confiscation cannot enter into the enforcement of a contract. If you make a bad bargain, it is your own fault.

The brief is based upon a decision of the United States Supreme Court, to wit:

Provisions in ordinances granting franchises to railways that the rate of fare shall be not more than 5 cents or that the grantees shall not charge a higher fare are contractual.

Attention is directed to the decision of the Colorado Supreme Court, to wit: "No perpetual franchise can be granted in Colorado."

Judge Lewis' decision was to the effect that the franchise between the city of Denver and the Denver Tramway, which contained a 5-cent fare clause, was "perpetual." He did, however, authorize the company to charge an 8-cent fare.

Strike on Massachusetts Interurban Put Off

The strike planned by the workers of the transportation and freight departments of the Boston & Worcester Street Railway, South Framingham, Mass., to go into effect on Nov. 5 was deferred by the carmen until Judge Edward F. Pierce of the Massachusetts Supreme Court could confer with officials of the company and a committee of the employees. Conductors and motormen alleged that no attention has been paid to their demands for more wages and recognition of the union.

When the strike was voted, the following statement was given out:

Patrons of the Boston & Worcester Street Railway are notified that the motormen, conductors, one-man car operators, bus operators and others employed in the freight and transportation departments are going to suspend work on Nov. 5, at 12:06 a.m.

We regret the necessity of doing this, but for more than a year we have been trying to get the receiver of the property to deal with us. He declines to recognize our union, which has been organized on this property for thirteen years. We have been to the Supreme Court several times to get relief, but the receiver has blocked every attempt we have made to get it done.

We have been acting with him and the officers appointed by him since February, 1925, when he was appointed, and we believe were doing so under our contract. He treats this contract as just a mere scrap of paper. On Aug. 10, after eleven months of effort to accomplish something with the receiver, our meeting voted to suspend work and left the time of such suspension in the hands of the committee and international officers.

For nearly three months we have been endeavoring to arrive at some sort of an agreement with the receiver and have been blocked at every turn. We are giving the patrons of the road ample notice of this suspension.

A statement by the receiver discloses that the union had asked authority to negotiate a new contract through outside parties, not responsible to the court. The receiver in reply

asked the union to take its petition to the court in August, with the offer to have his attorney go along. P. J. O'Brien, Springfield, Mass., for the union, urged a postponement until Judge Pierce could act on the petition.

Merchants Want Railways of New York to Operate Buses

The committee on city transit of the Merchants' Association proposed on Nov. 10 that the Board of Estimate should consider the rights of existing transit companies in the granting of new bus franchises and grant such franchises only to existing companies in Manhattan, the Bronx, Brooklyn and Queens for extension of present lines.

The proposal was incorporated in the committee's report of a consideration of the Board of Transportation's recommendation to grant new city-wide bus franchises, and the report opposed this recommendation in that it "disregards the principle of unification and economic utilization of existing means of transportation and fails to consider the property rights of companies now operating." Among other things the report said:

We believe that the existing surface, bus and subway lines should be encouraged to develop bus lines within their territories as auxiliaries and feeders whenever circumstances render such action desirable or practicable. Any other method of handling the question of surface transportation will merely lead to increased cost and further complications which would inevitably postpone a solution of the transit problems of New York City.

Provided equitable terms for any required new bus franchises can be agreed upon with the companies specified, we suggest the following as a basis for combining serviceable existing facilities with new and additional motor bus routes when shown to be necessary:

For Manhattan—The existing motor bus system of the Fifth Avenue Coach Company in combination with the lines of the New York Railways Company now controlled by it.

For the Bronx—The Third Avenue Railway system controlling the Union Railway Company, and other lines extending into Westchester County.

For Brooklyn—The combined trolley lines of the Brooklyn-Manhattan Transit Company and the Brooklyn City Railroad.

For Queens—Co-ordination under unified control of such existing surface lines as are serviceable, with such additional bus lines as may be desirable.

New Chattanooga Cars Praised

Public felicitations are due the Tennessee Electric Power Company for the public spirit recently exhibited in providing Chattanooga with the handsome new cars, as nearly noiseless as they can be made, and which are attractive and comfortable. Public utilities do not always show so marked a consideration for the comfort and the needs of their patrons, and when railways at last come to realize that in order to maintain competition with other modes of transportation they must provide equal accommodation with respect of comfort, ease of traction and promptness in reaching destination, it is for the public to show appreciation. There is every reason to believe that the public will show its appreciation of the company's enterprise by patronizing the cars liberally.—*Chattanooga Times*.

Gerard Swope Talks on Industry Responsibilities

At the annual dinner of the Associated Business Papers, Inc., and national conference of business paper editors held at the Hotel Astor, New York, on the evening of Nov. 10, with 300 in attendance, Gerard Swope, president both of the General Electric Company and the National Electrical Manufacturers' Association, spoke on "The Responsibilities of Modern Industries," dwelling on these as they concern, first, the industry itself; second, the public; third, the employee, and, last, the shareholder. Mr. Swope praised the business papers as interpreters and counselors in the formulation of high industrial standards.

Donald Kirk David, assistant dean Harvard School of Business Administration, spoke on "Aims and Responsibilities of Education in Merchandising," and there was a presentation to W. H. Ukers in recognition of his services in establishing the standards of practice of the Associated Business Papers. M. C. Robbins of the Robbins Publishing Company made the presentation. Malcolm Muir, vice-president of the McGraw-Hill Publishing Company, Inc., was toastmaster.

Court Upholds St. Louis Parking Provision

The St. Louis Court of Appeals has upheld a St. Louis city ordinance which prohibits parking of automobiles in the down-town shopping district. The measure went into effect on Jan. 26, 1926, and applies to the district bounded by Carr, Market, Fourth and Twelfth Streets. The decision is of interest to the local railway and bus companies, since it will enable them to avoid the delays incident to automobile owners trying to park in the downtown streets.

The ordinance was attacked by John E. Corvey, an attorney, who was fined \$5 and costs by City Court Judge Rosecan on July 8, last, for parking his automobile on Market Street. Mr. Corvey had sought to set the ordinance aside on the grounds that it bore the date "Jan. 25, 1925," instead of "1926." He also attacked the constitutionality of the law. Concerning the mistake in the date showing the approval of the Mayor, Judge Daues held that the ordinance automatically took effect within twenty days, since Mayor Miller had not vetoed it, even if the error in date could invalidate the approval.

15 per Cent Rate Increase on Elgin Road Deferred

An increase of approximately 15 per cent in suburban passenger rates scheduled to become effective Nov. 12 by the Chicago, Aurora & Elgin Railroad, Aurora, Ill., has been postponed until next May. The petition was filed last June and a favorable decision was handed down by the Illinois Commerce Commission early this week. The proposed rates, made necessary by rapidly mounting labor and operating charges, were approximately equal to those charged by several competing steam railroads.

Steam Versus Electricity

Trained Observer's Inspection a Vivid Argument for Railroad Electrification—Merits of Both Roads Outlined

Pursuant to an order from the editor of the Chicago *Tribune*, James O'Donnell Bennett of the staff of that paper rode from Chicago to Milwaukee by the new electric line of the Chicago, North Shore & Milwaukee Railroad, 85½ miles, and returned by the old steam cars, 85 miles, making copious, prompt and careful notes on cost, speed, cleanliness, comfort and civility as offered by the respective roads. On the whole, the little trip seemed to him about the most vivid argument for electrification of railroads that there is—and for the new spirit that seems to go with electrification.

Both trains on which Mr. Bennett rode were on time, but the contrast in the appointments of the two was "striking," to use a much-maligned word. The porter on the electric train wore spotless white linen; the patient soul on the steam train, who dusted and dusted and dusted, wore hot blue cloth. The washroom facilities on both trains were practically identical, save that the electric equipment was more on a doll house scale. On the steam train the magazine vendor shouted his wares; on the electric train the porter brought you the latest magazines bound in neat black folders.

As the reporter ciphered it out the long and short of it is that the Chicago & North Western steam railway saved him eighteen minutes, which, as he is not an important person, did not matter much to him. It also saved him from eye strain because its roadbed is solid as the rock of ages and its rolling stock like steel safes; hence little jolting of the car and no swaying when he was reading.

The Chicago, North Shore & Milwaukee electric railroad saved him 74 cents, which is half the price of a good meal or of a tolerable reprint of some great book. It also pampered any self-esteem by treating him—in the matter of those fleeting courtesies which are so sweet a solace to a traveler—as if he were an important person. Above all it sent him from its train as he came to it—clean, good natured and rested. From the other line, owing to inevitable smoke and grit from the engine he departed with only one proper destination—and that a bathtub.

In the course of his account of the trip Mr. Bennett set down distinctly the relative merits of the two roads under the heads: Cost, speed, cleanliness, comfort and civility. According to him civility on the electric line was perfect. It was watchful and alert, and it was tireless without being oppressive. Upon leaving Chicago the porter brought each passenger an afternoon newspaper (free), and 35 minutes out he served iced water and peppermints from a tray. All questions were answered with precision and promptness. Deportment of the electric station personnel in both Chicago and Milwaukee was the same. Mr. Bennett never saw better treatment of passengers.

On the steam line civility was good

to fair, shading off either to curtness or to slapdash. There was no offense intended or conveyed, but the employees certainly made you know your place as a passenger, "while the electric people treated you like company." Neither personnel knew Mr. Bennett was a reporter. The steam line civility was weakest in the stations—at the ticket windows—where the employees inclined to abruptness, sometimes answering questions scantily or with weary resignation. They displayed no interest in a passenger's bewilderments or anxieties. As Mr. Bennett stated it: "They were

there to sell tickets, not to pamper you."

The sole annoyance on the electric was the swaying of the cars under high speed, making reading of small print difficult and legible writing impossible. In this connection Mr. Bennett said:

In the diner luncheon became an adventure in dish balancing for me and a disaster for the tablecloth. Passing from car to car while train was moving was dangerous, and the conductor anxiously warned passengers not to do it, and gave them a helping hand when they insisted on making the move. Manifestly the roadbed needs heavier ballasting and perhaps heavier rolling stock. Ventilation of cars was admirable and temperature right.

Franchise Discussed at Jacksonville

Management Sets Forth Reasons Why a Thirty-Year Extension is Necessary—Operating Statement Offered as Testimony of Company's Position

PUBLIC hearings are being held at Jacksonville, Fla., on the proposed new 30-year franchise for the Jacksonville Traction Company. The existing grant has four years to run. Several of the city's clubs have indorsed the plan of a new franchise fair to both city and company. The franchise now pending before the Council was introduced in August by Councilman George J. Garcia. If the grant is passed by the Council it must be approved by the voters before it becomes valid.

At one of the recent hearings Mr. Garcia explained how it was that he came to act as sponsor for the new grant. He indicated that as a champion of better railway service he had conferred with John P. Ingle, manager of the company, but that Mr. Ingle had told him the banks would not loan the company money on a short franchise to make the extensions and improvements desired by the company and demanded by the public. Mr. Garcia then said:

I verified his statement, from a number of bankers. Then I told Mr. Ingle to draw up some kind of a bill and I would introduce it to "start action." What I want is better service and I'm going to do everything in my power to get it. I believe if the city takes over the railway, it can be successfully operated, but if it does not, then let the company try to get a new franchise. Above all, we want better service.

Another recent speaker was Giles Patterson. His most important concern appeared to be about the question of safeguarding the city's interests. In making his recommendations, Mr. Patterson stressed the necessity of access by the city to the company's records and the need for careful examination of the situation before a franchise is granted. He suggested that a new franchise require the company to file with the city all data covering its financial operations.

Mr. Ingle feels that the officers of the company are entitled to ask the city to relieve the railway of the 3 per cent franchise tax and the expense of paving in order that earnings may be more nearly sufficient to attract the additional capital the company must secure from time to time to enable the system to keep pace with the growth of the city and yet at the same time keep the fare at as low a figure as possible for the benefit of the car rider.

Mr. Ingle was quoted as follows:

I believe that as a matter of public policy the street car should be regarded as the poor man's means of transportation and everything should be done to make the cost of a ride as low as possible. All burdens levied on the company tend to increase the fare, for in the last analysis we all realize that they are reflected in the fare and are paid by the car rider.

But there is another reason, and that is the financial ability of the company to continue to give adequate service with the additional investment of \$750,000 we intend to make if a proper franchise is allowed and at the present fare.

Our financial statement for the year ended Aug. 31, 1926, is as follows:

Gross earnings	\$1,584,731
Operating expenses	858,958
Balance	725,773
Taxes	122,941
Balance	604,632
Depreciation	175,000
Balance	\$429,632

This balance of \$429,632 represents 8 per cent on an investment of \$5,360,000 and while this may not be all that the owners of the property are legally entitled to receive it might be regarded under the circumstances as fairly good.

Let us see what will happen to our balance of \$429,632 after we replace our 5 per cent bonds with 7 per cent bonds, make the added investment of \$750,000 and give the increased service that we contemplate.

First we will run 737,800 more car miles which at 20 cents per car-mile will add to our operating expenses \$147,560.

We will lose \$30,600 on the operation of the buses.

Depreciation on the added investment at 3½ per cent will be \$23,950.

The additional investment will increase our taxes, we must estimate, \$10,000. Additional interest on the \$1,245,000 bonds when we replace these 5 per cent bonds with 7 per cent will be \$24,900. This gives a total increase in expense of \$288,120.

We estimate that with the added service our gross earnings will increase 5 per cent, or \$79,240, which, deducted from the added expenses of \$288,120, leaves a net increase in cost of \$208,880.

If this net additional expense is deducted from the present balance of \$429,632 we have left only \$220,752, which is only 8 per cent on an investment of \$2,760,000, and no reasonable person can claim that this is a fair return on a fair value of the property being used in serving the public.

Advertisements Tell Railway Story.

—The Duluth Street Railway is running in the newspapers a series of statements for the information of its patrons and public upon matters pertaining to street car service in the city of Duluth, Minn. The advertisements are signed Twin Ports Electric Lines. The first statement was called "Fare—7 Cents to Regular Patrons." The next statement dealt with the cost of the ride.

One-Man Cars on Nineteen Routes in Buffalo

With the extension of one-man car service to the Main Street and Kenmore lines, the two longest and most heavily patronized local lines in Buffalo, N. Y., the International Railway is operating one-man cars on nineteen routes in the city, leaving two-man crews on only four lines. One of these four routes the company is seeking to abandon entirely and on one of the others the company is unable to operate one-man cars because of the refusal of the city to grant permission to construct loops at the end of the route. It is the intention of the railway eventually to operate one-man cars on every local line in Buffalo.

Twice the City Council of Buffalo has made unsuccessful appeals to the Public Service Commission to prohibit one-man car operation. A renewed request was made in a general bill of complaint filed by the city against the company to the state utilities board two months ago.

Alton Deal Approved

The Illinois Commerce Commission on Nov. 5 issued a certificate of convenience and necessity to the St. Louis & Alton Railroad, which will operate the old Alton, Granite & St. Louis Traction Company's interurban line between St. Louis, Mo., and Alton, Ill. The Illinois commission also approved the purchase by the new company of the traction company's property from Louis Clements, special master, and E. M. Gregory, receiver for the Alton, Granite & St. Louis Traction Company, for \$999,000.

Changes in Seattle Service

Operations of the Seattle Municipal Street Railway in Seattle, Wash., will be curtailed in one direction and expanded in another within a short time. The buses on Tenth Avenue Northeast, heretofore operated by private parties, began operation Nov. 1 under municipal ownership. Ten buses will travel the entire length of the avenue. Discontinuance of shuttle service on several lines is also announced, including the Youngstown and Ray Street shuttle lines, as well as curtailment of service on the Lake Burien, Mercer Street and Boston Street shuttles. It is estimated that these curtailments in service will reduce operating expenses approximately \$100,000 a year.

Rapid Transit Proposal Advanced at St. Louis

Another step toward the rapid transit system proposed for St. Louis, Mo., was taken by the rapid transit committee of the Aldermen when it ordered Associate City Counselor Farris to prepare the drafts of legislative measures needed to pave the way for the system.

These bills will provide for the legal status of a proposed rapid transit commission, the extension of rapid transit bonds for fifty years and for the placing of special assessments against property benefited by the proposed system.

C. E. Smith, consulting engineer for

the city, has estimated that it will take about fourteen years to complete the rapid transit program outlined in the recent report. About two years will be needed to pass the necessary legislation. The next two years would be devoted to building the down-town subways, and another five years for the second phase of construction, the extension of the tubes to Grand Boulevard. Finally five years would be devoted to the last stage of construction, the extension of the system to the city limits. Should St. Louis in the meantime decide to extend its city limits to the Franklin, Jefferson and St. Charles Counties lines it would take considerably longer to complete a rapid transit system to provide for the needs of the added territory.

The aldermanic committee has not decided whether to provide for a subway or elevated system.

Ten-Cent Fare Sought in Kingston

The Kingston Consolidated Railroad has applied to the Public Service Commission for authority to charge a 10-cent cash fare, three tickets for 25 cents, and transfer privileges with the Kingston City Transportation Corporation, operating buses in Kingston, N. Y. The present fare is 8 cents.

In its petition the company says the total revenue in 1924 was \$200,610 and total expenses \$178,782, leaving \$21,828 available for return upon its property used in giving transportation service in Kingston, or 3.4 per cent. Total operating revenues from Nov. 1, 1925, to Oct. 1, 1926, were \$123,237 and the expenses of operation \$93,622. Taxes paid were \$10,443. The amount available for return upon its property and contingent expenses was \$19,533.

Total operating revenues on the bus line from March 10 to Sept. 30, 1926, were \$31,888 and total operating expenses \$25,484. Taxes paid were \$240, leaving \$6,163 available for return and contingencies.

The Mule Car Has a Day in Nashville

The Nashville Railway & Light Company put on a big parade on Oct. 29 in Nashville, Tenn., demonstrating the 60 years of progress from the mule car to the railway parlor coach. Public inspection of the first mule car, first electric car and ten new cars parked on Eighth Avenue North between Broadway and Church lasted from 2:30 p.m. until 5 p.m. The parade, which boasted of a gold sword presented to Gen. Andrew Jackson, was led by the "President Andrew Jackson," a model of the ten new cars, costing \$150,000. Distinguished Tennesseans live again in the coach names, namely, Andrew Jackson, James Robertson, founder of Nashville; John Sevier, first Governor of Tennessee; President James K. Polk, and others. Each new car seats 44. They are finished in red, olive and white, have automobile-type brakes, wide, convenient doors and steps, leather seats. Gone for 37 years, the old mule car returned for a day and the occasion was a festive one.

Relief for St. Paul Property Denied

The amendment to the charter of St. Paul, Minn., which would have enabled the City Council to relieve the St. Paul City Railway in whole or in part of certain charter and franchise requirements relating to street paving and maintenance was lost at the election on Nov. 2. Although the vote was about 60 per cent for the amendment, the law requires a 60 per cent majority of the votes cast at the election. A neglect to vote at all was against passage of the amendment. The proposed amendment in its purport did not relieve the company, but it enabled the Council to act in these matters in such measure as might be deemed best for the interests of the city. The relief would have totaled \$117,000 a year.

Thus the Council may not act even though the present fare rate of 8 cents and six tokens for 40 cents was fixed by the Minnesota Railroad and Warehouse Commission on the theory and a strong suggestion that relief along the lines indicated would be given the company. Rate of fare is dependent upon cost of service, and it had been urged on voters that street paving and maintenance under the city charter and the franchise are part of the cost of service.

International Railway Against Higher Fare Opponents

The International Railway, Buffalo, N. Y., has brought an equity action in the United States District Court against members of the State Public Service Commission, the board itself, the cities of Buffalo, Niagara Falls, Lockport, Tonawanda and North Tonawanda and the villages of Lancaster and LaSalle. The action asks for temporary and permanent injunctions restraining the defendants from interfering with the collection of new fare charges set forth in the tariff filed by the company with the commission in September.

In its complaint the International Railway charges that the state is compelling the plaintiff to operate its lines at a rate of fare alleged to be confiscatory. The company asks United States District Judge John R. Hazel to designate two other judges to hear and determine with him the plaintiff's application for an interlocutory injunction and to hear evidence in the final determination of the equity suit. The company says its valuation should be fixed at \$100,000,000 instead of the \$22,000,000 fixed by the New York State Public Service Commission several years ago in a former rate proceeding similar to the present one.

The institution of the equity suit by the International Railway is the result of the refusal by the state commission to issue an order allowing the traction company to put into effect the tariff of increased fare charges which it filed on Sept. 16. The company seeks to increase its local fares in the city of Buffalo from 8 cents or two tokens for 15 cents to a 10-cent fare. Half fares in Buffalo would be increased from 3 to 5 cents. In the city of Niagara Falls it would increase local fares from 5 cents to 8 cents or two

tokens for 15 cents. It is proposed to charge half fare of 5 cents to children between the ages of five and twelve years. Local fares in Lockport, now 6 cents, would be increased to 8 cents or two tokens for 15 cents. LaSalle local fares, now 5 cents, would be jumped to 8 cents or two tokens for 15 cents. Interurban fares on the Buffalo-Niagara Falls and Buffalo, Lockport and Olcott divisions would be increased from the present charge of 2½ cents a mile to 3 cents a mile.

"L" Lease Argument Enrolls Services of Edward A. Roberts

Edward A. Roberts, transit expert and consulting engineer, of New York, has been engaged by the United Business Men's Association in connection with the discussion of the Frankford "L" lease, now under consideration by the Public Service Commission. Mr. Roberts attended the first hearing. He is preparing a list of questions concerning the earnings of the Philadelphia Rapid Transit Company. Harold M. Evans, representing the City Club, the Northeast Philadelphia Chamber of Commerce and the Civic Club, charged on Nov. 5 that complete facts with regard to the lease of the Frankford "L" to the Philadelphia Rapid Transit Company had not been brought out before the commission.

Chicago Surface Lines Loses to City in Paving Decision

A decision was handed down by the Illinois Supreme Court in Chicago recently declaring that the Chicago Surface Lines must pay for repaving when the city has torn up the street between its rails for installation or repair of sewers and water mains. This gives the city a potent weapon, it is believed, in its present negotiations with the Surface Lines for a new franchise. The decision ends a fight which has been in the courts for ten years and upholds a decision of the Appellate Court, which had reversed a Circuit Court ruling against the city.

Franchise Extension Defeated in Barborton

The franchise granted the Northern Ohio Power & Light Company by the city of Barborton last August was rejected by the voters at a referendum election on Nov. 2 by the narrow margin of 220 votes.

A study of the result shows that sections of the city where working people reside approved the franchise, while the so-called better residential sections voted against it. The company took the position that the issue was a civic one and that it was as much to the city's interest to approve the ordinance as it was to the company's.

Since the rejection of the franchise, the Council has offered to repass the ordinance under the pledge that no referendum will be called. The company has not decided to accept the proposal, feeling that it went too far in the defeated ordinance in agreeing to pay for paving between the rails.

The ordinance which was defeated

In Appreciation of Roanoke's Electric Railway

In commenting on the general principle of the skip-stop system on electric railways, the *Roanoke Times* of Oct. 22 takes occasion to generalize on the system in that city. The comment runs as follows:

Railway service here is all that the public has a right to expect—indeed, it is far better than Roanoke deserves, everything taken into consideration. The railway has had anything but the best of it in its dealings with the city fathers. Nevertheless, it has gone right ahead making improvements to the service, making additions to the equipment, giving the city the very best available at all times. The railway has done its part toward solving the traffic problem in Roanoke. It cannot be accused of having laid down on the job ever.

The system in Roanoke is operated by the Roanoke Railway & Electric Company.

provided for an increase in fare between Barborton and Akron from 10 cents to 12½ cents and for an increase in the city of Barborton from 5 cents to seventeen tickets for \$1, four tickets for 25 cents, or a 7-cent cash fare.

The ordinance, a ten-year grant, provided for practically double-tracking the entire Barborton line at a cost of about \$150,000. It granted the city the right at each four-year period to examine the company's books to determine the rate of fare for the following four-year period. Control of service reposed with the city.

"Seeing Greater Chicago," a New Surface Lines Guide

A valuable sightseeing and route-guide by which residents and visitors to the big city can see Greater Chicago has been published by the Chicago Surface Lines. This is a 48-page illustrated pamphlet, including a map showing the system of the Surface Lines, the principal points of interest and direct lines of transportation. All directions given in the "Seeing Greater Chicago" presume starting from the "Loop." For additional information sightseers are asked to call the Chicago Surface Lines, at Dearborn 8800.

Piedmont & Northern Extension Plan Revived

Action was taken at a meeting of the directors of the Piedmont & Northern Railway, held in Greenville, S. C., on Nov. 3 looking to the completion of the system from Charlotte to Durham. This action was in the form of a resolution asking the stockholders to approve the expenditure necessary for the new trackage.

Two links of the line have been built, between Charlotte and Gastonia in North Carolina and between Spartanburg and Greenwood in South Carolina. The plan of the late James B. Duke, builder of the line, was thwarted by the World War, which halted all construction plans of this kind. Some months before Mr. Duke died, two years ago, discussion of the extension of the road was renewed and it was understood

that plans for construction were being made. These plans were again halted by the death of the promotor.

The road is standard gage and is electrically operated. The operating company is affiliated with the Duke Power Company. The distance from Durham to Greenwood is 300 miles.

The stockholders will meet in Greenville on Dec. 8.

Hearing on St. Louis Fares Nov. 16

The Missouri Public Service Commission at Jefferson City, Mo., on Nov. 16 will hold a public hearing on the application of Receiver Rolla Wells of the United Railways, St. Louis, for an increase in fares from 7 cents to 8 cents or two tokens for 15 cents.

The original application was filed last June, but a few weeks ago Receiver Wells filed a request for an immediate increase in fares pending a final decision.

The city has opposed the increase unless a complete audit of the company's books reveals that more revenue is actually needed. The city officials also favor segregation of the revenues of the city and county lines, contending that city riders should not be compelled to carry the load for county riders who are transported at a loss.

Interstate Trainmen Receive Wage Boost

A voluntary increase of 2 cents an hour was made in the wages of the trainmen of the Interstate Public Service Company, Indianapolis, Ind., effective on Oct. 1. The new scale, in cents per hour, is as follows:

For first-year men, 41; second-year men 42; third-year men, 43; fourth-year men, 44; fifth-year men, 45, and for men employed longer than five years, 46.

Railway at Dover, N. J., Protests Against Bus

The Morris County Traction Company, Dover, N. J., is opposed to having Arthur J. Seldney operate a bus between Morristown and Wilsonville, N. J. Appearing before the Public Utilities Commission recently, C. W. Fields, superintendent of the railway, declared that the bus had caused a decrease of at least 16 per cent in the number of passengers carried on its line between Morristown and the State Hospital at Morris Plains. The Lackawanna Railroad, which had entered an appearance in the case, advised the commission it would not oppose. The commission reserved decision.

Fare Hearings Resumed.—Hearings on the petition of the United Traction Company, Albany, N. Y., for an increase in fare scheduled before the Public Service Commission on Nov. 15 has been postponed to Nov. 30. Testimony on the application will be taken on the basis of segregated revenues and expenses in accordance with the ruling of the commission that the company must show its profits and losses by cities lines.

Recent Bus Developments

Amended Petition in New York Case

An amended petition for a bus franchise in New York City has been submitted to the franchise bureau of the Board of Estimate by the Service Bus Corporation. The supplemental petition is designed to meet additional requirements laid down by John H. Delaney, chairman of the Board of Transportation, who has favored granting franchises for bus operation in Manhattan, the Bronx, Brooklyn and Queens to the Equitable Coach Company.

The new offer is in the form of a letter to the board signed by Ernest M. Howe, managing director of the Service corporation. It petitions for a ten-year franchise, with a ten-year renewal privilege rather than a 25-year franchise, as in the original petition, and would give 3 rather than 2 per cent of the bus line's earnings to the city. Original offers to operate on a straight 5-cent fare basis with free transfers within a borough and half rate to school children stand.

The Service Bus Corporation also indicates that it will accept a franchise for the Borough of Manhattan only or a permit for any other boroughs except Staten Island added as the board may desire.

Bus Service to Argentine District at Kansas City Discontinued

The Kansas City Public Service Company, Kansas City, Mo., on Oct. 26 applied to the Kansas Public Service Commission for permission to discontinue its bus service to the Argentine district of Kansas City, Kan. The bus service was originally installed to replace railway service during the period in which the Twelfth Street Viaduct was closed to cars. The recent restoration of railway service to the Argentine district made the continuance of the bus service unnecessary.

Shore Line Coach Company Seeks to Abandon Eight Miles

Permission to discontinue its service between Schererville and Crown Point, Ind., a distance of 8 miles along its Hammond to Crown Point route, was asked in a petition filed on Nov. 3 with the Public Service Commission of Indiana by the Shore Line Motor Coach Company, a subsidiary of the Gary Railways and Chicago, South Shore & South Bend Railroad. The service from Hammond to Crown Point has been operated for the past five years and for more than two years the route has been operated at a substantial loss. The certificate was acquired by the Gary Railways in September, 1924, and later transferred to the Shore Line Motor Coach Company.

Charles W. Chase, president of the

company, in referring to the poor earning situation, said that on May 1 of this year, feeling that the service rendered might not have been of a type to induce travel over the route, the street car type of motor coach was taken off and 24-passenger International parlor coaches were put on this run. This change, however, failed to stimulate riding, so that about a month ago the service was reduced from five to three round trips a day. This also failed to improve the earning situation, he explained. The deficit for the last two months was more than \$2,000 a month.

Pennsylvania Case to I.C.C.

Electric Railway Contends Bus Service Conducted at Loss by Steam Line Is Inimical to Provisions of Commerce Act—Novel Points Raised Against Railroad Seeking to Compete in Electric Railway Territory

IN ITS appeal to the Interstate Commerce Commission against the Reading Company, to which reference was made in the ELECTRIC RAILWAY JOURNAL for Nov. 6, the Schuylkill Railway asks that the commission command the Reading Company, a steam carrier, to refrain from engaging directly or indirectly in the business of owning, leasing or operating buses in Schuylkill County, unless and until the terms and conditions of engaging in such service shall be approved by the commission's certificate of public convenience and necessity. It also asks the commission to make such further order or orders as that body may consider proper.

This is another move in the proceeding by the Schuylkill Railway, an electric line, to prevent the steam carrier from operating buses in territory now served by the electric railway by both bus and trolley. The electric railway and its bus operating subsidiary, the Schuylkill Transportation Company, charge:

1. That the practice of the defendant in operating local trains (specifically mentioned) at a loss is a practice directly in violation of the interstate commerce act of 1887 and its amendments and supplements, in this: that the said practice causes undue, unreasonable and unjust discrimination against interstate commerce by carrying on intrastate passenger transportation between the points hereinbefore mentioned at rates or fares on a substantially lower level than the rates or fares fixed and collected in interstate passenger traffic passing through the same points on the same rails. The losses incurred in and by the operation of the local trains aforesaid must be and in fact are met from the common fund produced by the defendant's interstate and intrastate business. The carrying of freight is the only service conducted at a profit by the defendant. The greater part of the freight traffic of the defendant consists in the transportation of anthracite and soft coals and most of the earnings from that source come from interstate business. The complainants therefore charge that the defendant is paying its intrastate traffic losses incurred in the operation of the trains aforesaid with and out of freight earnings principally derived from interstate traffic to the undue and unreasonable advantage and preference of intrastate commerce and to the prejudice of interstate commerce.

2. That the said unlawful practice and undue, unreasonable and unjust discrimination against interstate commerce may

be removed by increasing the rates of fare on the said trains operated at a loss as aforesaid, or abandoning the trains.

2. That the proposed bus service if permitted would be only a continuation of the said unlawful practice in another form.
4. That the commission has power under the interstate commerce act of 1887, section 13, as amended by the transportation act of Feb. 28, 1920, section 416 (U. S. Statutes at Large 66 Congress, Sec. Session 1919-20, page 484), to cause the said unlawful practice as now carried on by the defendant to be removed as aforesaid, and to require that the defendant shall not undertake the proposed bus service without the commission's express approval of the terms and conditions of its financing and operation.

Wherefore, the complainants pray that the defendant may be required to answer the charges herein, and in particular to show in detail the earnings and entire cost of operation of all the trains hereinbefore mentioned, and that after due hearing and investigation an order be made commanding the defendant:

1. To remove the said unlawful practice.
2. To cease and desist from the aforesaid violations of the interstate commerce act.
3. To establish and put in force and apply in the future to the transportation of passengers between the points aforesaid in lieu of the fares hereinbefore named, such other fares as the commission may deem reasonable and just; but in no event less than the cost of operating the trains aforesaid or otherwise.
4. To cease to operate the said trains.

According to the complaint the steam railroad is substantially parallel with the electric railway between numerous points in Schuylkill County and between those points the two lines are competitive as regards strictly local and intrastate passenger business. There are no traffic agreements or understandings between the complainant and the defendant. The competition between them is unrestricted. The complainant, however, carries nothing but local passengers, while the defendant carries not only a great passenger traffic, which is mostly through traffic and interstate traffic, but also its immense anthracite coal freight traffic. Schuylkill County is the center of the anthracite mining industry served by the defendant and the larger part of the said coal carriage is interstate traffic. In comparison with the total amount of through and interstate passenger and freight traffic of the defend-

Ordinance Would Regulate Bus Operation

ant on and over the said competitive portion of its line in Schuylkill County, the amount of the defendant's local passenger traffic on that portion of its line is extremely small.

The electric railway charges the steam carrier with asserting, in proceeding before the Pennsylvania commission, its hope and expectation to overcome possible bus operating loss by increasing the number of bus passengers carried beyond the number now carried on its trains. The complainants seek to show that the defendant's hoped for and expected gain cannot be realized because there is no substantial amount of passenger traffic to be gained by the defendant for its buses except by diverting traffic from the competing lines of the Schuylkill Railway and other electric railway and bus companies now long and well established in the fields. It is charged that instead of the advantages now offered to the public by train service the defendant will by the proposed bus operation offer the public no transportation which is not already afforded by the complainants and other electric railway and bus companies. The electric railway avers that the proposed bus investment and operation by the steam carrier can only result in greater losses than the defendant now admits that it suffers in train operation and will suffer in bus operation.

Another Indiana Service

A coach line between Michigan City and South Bend, Ind., was established Oct. 23 by the Shore Line Motor Coach Company, a subsidiary of the Chicago, South Shore & South Bend Railroad, under an order of convenience and necessity recently granted by the Indiana Public Utilities Commission. The route is approximately 35 miles in length and parallels for most of the distance the tracks of the Chicago, South Shore & South Bend Railroad. The fare on the coach route will be the same as that charged on the electric trains. One morning and one afternoon coach in each direction between the two Indiana cities constitutes the initial schedule of the coach route. The Shore Line company operates 25 other routes in northern Indiana, southern Michigan and in Illinois.

Buses of Minneapolis Railway May Operate Over Parkways

A long-contested point has been settled by the park board regarding use of the parkways by the buses of the Minneapolis Street Railway, Minneapolis, Minn. The board by a vote of ten to four passed a regulation by which buses may operate over parkways upon payment of a license fee based on weight of vehicle, length of route and number of trips scheduled. The tax fee is put at 20 cents operation unit of "transportation of one ton over 100 miles of park highway." The application must be approved by ten members of the board and the fee paid upon receipt of permit. Applications must be filed with the board as well as the Minnesota Railroad and Warehouse Commission. Other lines utilizing parkways as a route between Minne-

apolis and St. Paul will be brought under the regulation, which was passed Nov. 4. They do not pick up passengers on the parkway.

Connecting Bus Line in Minneapolis Aids Transportation

The first trial of a connecting bus line instead of construction of a cross-town trolley line has been successful in Minneapolis, Minn., according to the findings of the Minneapolis Street Railway. The line has been installed on a newly paved cross-town street at Thirty-eighth. It connects the Bryant Avenue line on the west with the Minnehaha line on the east. The regular railway fare of 8 cents or a token sold at the rate of six for 40 cents is charged. Transfers are accepted and given to the electric lines crossed. This is eight blocks south toward the city limits from the Lake Street trolley cross-town line. The running time of the Thirty-eighth Street line is fifteen minutes. Eight to ten minutes headway is given in the day time and fifteen minutes after 8 p.m.

A second bus line has been installed on Lowry Avenue on the north side, which is equally important and is well patronized.

Railway Takes Over Neenah Line

The A. C. Homan Bus Line of Menasha, which has been supplying bus service in the vicinity of Neenah, Menasha and Appleton, Wis., in competition with the interurbans and buses of the Wisconsin Traction, Light, Heat & Power Company for the last five years, has been purchased by the traction company. The price involved in the transaction was not disclosed. The service provided by the Homan lines will be continued without interruption. The last obstacle to the sale of the line was the lack of assurance from the city of Neenah that other bus competition would not be permitted. That barrier was finally hurdled when the city agreed in the future to frown upon any attempt by a competing company to enter this field. On its part the company promised that no increase in fares would be asked and that the present standard of service would be maintained.

In outlining other bus activities of the company, A. K. Ellis vice-president of the traction company, stated that his company intended to start a bus line between Milwaukee and Green Bay and another between Fond du Lac and Madison.

The Purple Swan Versus the Blue Goose

A bus controversy between St. Louis, Mo., and Belleville, Ill., started on Nov. 2 when the Purple Swan bus line opened service from St. Louis to the Belleville, Ill., court house square via the St. Louis Municipal Bridge for a 30-cent fare. Promptly the Blue Goose line, owned and operated by the East St. Louis & Suburban Railway, East St. Louis, Ill., met the price cut and rearranged its schedules to meet the Purple Swan competition. The Blue Goose line had been charging 45 cents.

The Blue Goose line was started by the same management that now controls the Purple Swan company. It formerly charged 35 cents for the trip. The East St. Louis & Suburban Railway charges 39 cents by electric railway for the trip from St. Louis, Mo., to the Belleville square. The Blue Goose line operates on a certificate of convenience and necessity issued by the Illinois Commerce Commission. It does both an intrastate and interstate business. The Purple Swan line handles only interstate passengers and has no Illinois bus permit.

Further Bus Inroads Likely in Westfield

The Springfield Street Railway, Springfield, Mass., which a few months ago substituted buses on all lines in Westfield except a cross-town line, is now considering the use of buses to replace this trolley cross-town service. Roy Chambers, manager of the Westfield lines, has already approached the City Council concerning this proposed change. At the conference it was brought out that the line had operated at a loss. The railway in presenting its tentative plans for the new bus lines proposes to ask for a trial license through the winter months with the understanding that should buses prove inadequate trolley service would be continued. Two trolley cars are operated on the line.

The question will be taken up at the next meeting of the City Council. Opposition is likely to develop before the matter is settled, since other licenses to operate buses instead of trolley cars were granted by the City Council only with the understanding that this one cross-town line would continue to serve the city.

Would Substitute Buses.—The Westchester Street Transportation Company, Inc., subsidiary of the Third Avenue Railway, has applied to the Public Service Commission for authority to substitute buses in place of trolley cars on tracks in White Plains, N. Y., starting from the New York Central station and running through Main and Grove Streets to the Post Road and south on the Post Road to the White Plains-Scarsdale line. The company has a five-year grant in White Plains.

Adequate Bus Service to Be Substituted.—The City Council recently approved the Northern Ohio Power & Light Company's proposal to abandon operation of cars on the North Howard Street line between Federal Street and the intersection of Cuyahoga Falls Avenue and Main Street, Akron. Adequate bus service will be furnished to supplant the cars, the application stated. The company was also granted permission to remove street car tracks in North Howard Street, between the Little Cuyahoga River bridge and York Street. The installation of permanent bus lines will extend to all the points affected except between Glenwood Avenue and Olive Street. A tentative agreement is being considered by the city and the company officials to abandon the Grant and Bowers Street car lines. The distance included in all changes is about 2½ miles.

Financial and Corporate

Hemphill & Wells to Manage Poughkeepsie Property

Hemphill & Wells, New York, have assumed the management of the Poughkeepsie & Wappingers Falls Railway, Poughkeepsie, N. Y., following the withdrawal of the J. G. White Company as operating managers. Directors who have retired are Joseph K. Choate, vice-president of the White Corporation; J. I. Mange, president of the Associated Gas & Electric Corporation, which at one time held an option on the road, and Frank B. Lown. Their successors are Albert W. Hemphill, B. A. Tompkins, vice-president of the Bankers' Trust Company, New York City, and William Schickle, cashier of the Fallkill National Bank.

Mr. Hemphill has indicated that he and his partner, Gardner F. Wells, with other members of their staff, would be in Poughkeepsie for some time to study local conditions and transportation requirements, before deciding upon any changes in policy. He also indicated that George Wells, a brother of Gardner F. Wells, would be appointed resident manager of the road.

Hemphill & Wells own and operate the Interstate Street Railway, Attleboro, Mass., which provides Attleboro, North Attleboro and Plainfield with railway service and runs buses through Pawtucket to Providence. They have had a great deal of experience with combined trolley and bus service, and it is said that it was largely on the basis of their experience along these lines that they were retained in connection with the Poughkeepsie property.

The change in management just made marked the retirement of George W. Comfort, who has had charge of the road for the White Corporation since the resignation of Charles A. Brooks. Mr. Comfort will be assigned to one of the White properties elsewhere.

Sale of Interurban Advertised for Dec. 1

Property of the Cincinnati, Lawrenceburg & Aurora Electric Street Railroad, which recently suspended operation, will be sold at public auction at the courthouses in Hamilton County, Ohio, and Dearborn County, Indiana, on Dec. 1. The sale will be conducted under the supervision of William A. Stark, special master commissioner appointed by the Common Pleas Court of Hamilton and Dearborn Counties. In view of the fact that the property to be sold as a whole is situated in two states, prospective purchasers are privileged to bid at both sales.

The property includes all real estate owned by the company in addition to carhouses, depots, shops and rights-of-way, also all tangible assets. In this category are listed rails, buses, wires, poles, machinery, tools, equipment and

all franchises. Terms of the sale are cash on the day of the sale, except that bonds of the interurban may be used as part payment in lieu of cash as provided in the orders of the courts.

The railway extends from Anderson's Ferry in Cincinnati to Aurora, Ind., a distance of 57 miles. Part of the line is doubled tracked.

Additional Compensation for Kansas City Receivers

Fred W. Fleming and Francis M. Wilson, who recently relinquished their posts as receivers for the old Kansas City Railways, Kansas City, Mo., when that property was turned over to the Kansas City Public Service Company last month, each received additional salary allowances on Oct. 29 of \$3,875. At the same time James E. Goodrich, attorney for the receivers, received \$3,145. The special allowances were approved recently by the court for salary accruing between Sept. 1, the date originally set by the court as the end of the receivership, and the actual date of transfer of the properties. They were listed in Mr. Harding's report of expenditures filed in the federal court on Oct. 29.

\$1,000,000 of Bonds Offered to Milwaukee Customers

The securities department serving the Milwaukee Electric Railway & Light Company and affiliated Wisconsin utilities has been authorized to sell direct to home investors \$1,000,000 of the company's refunding and first mortgage 5 per cent gold bonds, series B, dated June 1, 1921, due June 1, 1961. These bonds are a portion of an issue of \$9,800,000 authorized by the Railroad Commission of Wisconsin to refund an equal amount of 6 per cent bonds of the company called for payment on Sept. 1, 1926.

The bonds are offered in \$500 and \$1,000 sizes, at 98 per cent of par; the \$500 bond sells for \$490, the \$1,000 bond for \$980, plus accrued interest. Home investors can pay all cash or 10 per cent down and 10 per cent monthly for nine months. Buyers on the payment plan are allowed 5 per cent interest on their monthly payments, credited on the final payment. If unable to complete payments, they get back what they have paid in, but without interest.

The company reserves the right to call the bonds for payment on any interest date, giving four weeks notice by publication, at 104½ per cent of par, 6½ per cent above the price at which the bonds are now being sold.

The company directs attention to the fact that during its 30 years in business it has paid every obligation, principal and interest, on the due date in full and in cash. It has paid preferred share dividends in full and in cash every three months for the last 26 years. It has

paid common share dividends in cash, at a yearly average rate of 8 per cent, every year for the last 24 years.

Another Hearing on Kite Route Affairs

At the hearing between officers of the Denver & Interurban Railway, Denver, Col., William H. Edmunds, receiver; John H. Gabriel, special master, and attorneys for the Guaranty Trust Company, New York, attorneys for the cities through which cars run, it was brought out that the Denver & Interurban Motorbus Company was organized in self-defense. The bus company and the railway are competitive, do not share profits, but are owned by the same interests. Judge J. Foster Symes will go over the evidence presented on Nov. 5, and then set a date for hearing. The Colorado & Southern Railroad, owner of the Kite and the bus company, desires to discard the railway, but the citizens oppose this plan.

Merger Talk Revived in Washington

The perennial question of a merger in Washington, D. C., of the Capital Traction Company and the Washington Railway & Electric Company is now being discussed. While Commissioner J. Franklin Bell, chairman of the Public Utility Commission, announces that preparation of proposed legislation to force the railways to enter into a voluntary merger will be started shortly, William F. Ham, president of the Washington Railway & Electric Company, at a recent informal public hearing, said that any plan for a merger of the Washington traction companies which failed to guarantee the full valuation of physical property and a fair return on the capital investment would be opposed by his company.

Later John Foster Dulles, of counsel for the North American Company, is said to have assured commission officials that his company would undertake immediately negotiations with the Capital Traction and the Washington Railway & Electric Company to bring about a merger of operation, sanguine that some step toward its accomplishment would be taken before Congress reconvenes next month.

Just prior to Mr. Dulles' appearance at the office of Commissioner Bell the commission made public a letter it received from Frank L. Dame, president of the North American Company, showing the corporation's present holdings in the utility corporations of the district. The communication was in reply to information asked by the commission when it started an investigation of the company's interests in the local corporations.

Mr. Dame revealed that the company and its agents now hold 48,500 shares of common and 6,300 shares of preferred stock of the Washington Railway & Electric Company, 3,012 shares of the Capital Traction Company and 21,207 shares of the Washington Rapid Transit Company. Compared with its holdings last January, the present ownership represents an increase of

3,300 shares of the Washington Railway & Electric Company's preferred stock, an increase of 81 shares of the bus company's stock and a loss of 990 shares of the Capital Traction Company's stock.

Utilities officials point out that the North American Company has full control of the Washington Rapid Transit Company, but it owns only about 36 per cent of the voting shares of the Washington Railway & Electric Company, and therefore cannot alone control its management. Its ownership in the Capital Traction Company is about 40 per cent of the total stock issued.

Authority for Worcester Refunding Not Conferred

Directors of the Springfield Street Railway and the Worcester Consolidated Street Railway, Springfield and Worcester, Mass., have re-elected their officers. Financial matters of importance were taken up at the business meeting. Bonds of the Springfield company, with the single exception of a \$330,000 issue, which will be refunded in January, are all taken care of up to 1940. Stockholders of the Worcester Consolidated deferred action on its refinancing plans to take care of a large amount of bonds due soon but authorized the directors at their discretion to discontinue any unprofitable lines and to sell the trackage and equipment of abandoned lines.

Liquidation of Painesville Road Proceeding

Further facts are available about the discontinuance and liquidation of the Cleveland, Painesville & Eastern Railroad, Willoughby, Ohio. The Cleveland Electric Illuminating Company paid the Cleveland, Painesville & Eastern \$1,400,000 for its light and power business, which included all wires and poles used for electric distribution. Out of this \$1,400,000 the Cleveland, Painesville & Eastern paid off its \$500,000 of first mortgage bonds and used the balance—\$900,000—to pay off a part of its \$1,131,000 consolidated 6 per cent bonds. The rest of these bonds are now being paid off out of money received by the Cleveland, Painesville & Eastern in the distribution of its railway property. To date, 95 per cent of the bonds have been paid off and the balance will be paid in the near future.

The common stock holders will receive nothing in the final adjudication of the company's business, but the preferred stock holders will receive approximately 45 per cent of their holdings. In fact, payments to them may go as high as 50 per cent, but will not reach the 60 per cent figure originally anticipated.

Vice-President Douglas, in disposing of the property of the Cleveland, Painesville & Eastern after the sale of the light and power business, has been selling the rest of the property piecemeal to various interests instead of selling all of the balance to a junk dealer. Practically only the rails and overhead have gone to the junk dealers. Cars and machinery, all still usable, have been sold at good prices.

In addition the company still owns a large amount of valuable realty in Painesville, Nottingham and Willoughby, and controls Willough Beach Park, which it is holding at a price of \$500,000.

Purchase of Line by City Proposed

Purchase by the city of Seattle, Wash., from the Pacific Northwest Traction Company of the Greenwood car line on North and West Eighty-fifth Street, along the northern city limits, for \$1,001 is proposed in an ordinance recently introduced in the City Council. The consideration includes \$1 for the line and \$1,000 for the paving between the tracks, which is being done jointly by the city and county on Eighty-fifth Street. The city has been operating a shuttle car over the line for years. The traction company would be permitted to haul freight over the line until Dec. 31, 1934.

Rhode Island Merger Offer Modified

The Rhode Island Public Service Company, Providence, R. I., has made an alternative offer to the stockholders of the United Electric Railways whereby two shares of the Service Company's preferred stock will be exchanged for one share of the railway stock. In addition, those who dispose of their stock under the offer will receive \$1 per share in cash if 80 per cent of the stock outstanding is deposited on or before Nov. 15.

The new offer was obtained by the directors of the United Electric Railways and all of the directors who own stock have decided to deposit their shares. A statement says:

Your board has carefully considered the plan and agreement and the additional arrangements above stated. They contain the best proposition for stockholders of your company which your board has received. Such of your directors as own stock of your company have decided to deposit their shares under the plan and agreement.

The original offer for the traction company stock, made by the service company under its plan for merging the United Electric and the Narragansett Company, provided for the exchange of one share of class A of the Service Company for one share of the U.E.R. stock. The new offer is optional with the depositor. He may receive either two shares of the preferred or one share of the class A, as he elects.

Ohio Interurban Suspends Service

Operation of interurban cars between Dayton and Piqua, Ohio, by the Dayton, Covington & Piqua Traction Company ceased on Nov. 6. Discontinuance of the service leaves a half dozen towns in the central part of Ohio without interurban service. Officials of the interurban said that the line, which had been a losing proposition for the past three years, would be junked. It is expected that the State Public Utilities Commission, acting at the request of residents of several towns affected by the discontinuance of the service, will award a bus certificate to one of several individuals who have expressed their intention of seeking operating rights.

Indiana Commission Seeks More Money for Experts

Recommendations for salary increases in the staff of the Indiana Public Service Commission in order to retain expert engineers and accountants are contained in a budget for the next two years filed by Howell Ellis, secretary of the commission. The engineers aid the commission in arriving at valuations for public utilities when new rates are in question. Mr. Ellis pointed out that with the loss to the department in the last few months of two expert engineers and three accountants, all trained in the work, the commission feels it should have sufficient money and authority to increase the salaries of such experts in order to prevent their leaving the commission for more remunerative positions. He explained that the recent annual report of the commission showed that body actually to be making money for the state by collecting more than enough in fees to pay the expense of the department for the year.

Traffic on the Increase.—For the nine months period ended Sept. 30, 1926, the United Railways & Electric Company, Baltimore, Md., carried 166,838,335, against 166,179,587 for a similar period of 1925. For the first six months these figures were 113,715,254 and 112,761,063 respectively.

Railway Service Suspends.—The street railway system in McKinney, Tex., operated by the Texas Electric Railway, suspended operation on Nov. 1, after nearly twenty years of service. Failure to pay actual maintenance and operating expenses was given as the cause by Jack Beall of Dallas, president of the Texas Electric Railway. This reason was contained in a letter to Thomas W. Perkins and the City Commissioner. It is said that J. H. Young, former street railway conductor, will operate a bus over the same route in that city.

Wants Tax Reduced.—The Western Ohio Railway, Lima, Ohio, in a bill of complaint in the federal court is seeking relief from what it contends to be excessive taxes levied on its property in six Ohio counties. The company charges that its property is valued at \$1,300,000, but that it is on the tax duplicate for \$1,600,000, against its protests. An interlocutory injunction is asked to prevent the treasurer from collecting the taxes assessed on the property of the company for 1925. One-half of the amount has been paid.

Reports on September Earnings.—Gross earnings of the Indianapolis Street Railway, Indianapolis, Ind., for September were \$1,660 less than the gross earnings for September a year ago, the figures being \$440,060 and \$441,721 respectively. Operating expenses for last September were \$20,654 greater than a year ago. This was attributed to the greater number of buses the company has in operation this year. Total operating expense for last month was \$334,057. The company is now operating 32 buses, compared with seven in service at this time a year ago.

Book Reviews

Business Ethics—A Manual of Modern Morals

By James Melvin Lee. The Ronald Press. 312 pages, \$3.25.

Ancient and modern methods of business are contrasted in this "Bible of Business," by James Melvin Lee, Litt. D. Creeds of the various industries showing the work-a-day practices from the Laundry Owners National Association to the American Electric Railway Association are set forth in codes supplementary to and amplifying the principles "preached" in the text. But since "the wages of sin is publicity," says Dr. Lee, and publicity, whether required by law or otherwise, promotes honesty in business, laws are helpful which require corporations to publish statements of their financial condition. Especially essential is it for public service corporations. "Fairness can only be expected when the people know the facts." He seems to be in sympathy, too, with Ivy L. Lee (though no relation, both are the sons of Methodist preachers), whom he quotes from an address Mr. Lee delivered at the annual convention of the American Electric Railway Association in October, 1916, in which he said: "No one must attempt to adopt publicity or make use of it for his benefit unless he is prepared to take all the consequences. A company cannot sing of its prosperity to security holders and at the same time cry over its poverty to tax appraisers and its workmen."

The number of practical illustrations presented in the treatise shows that the author has spent years in collecting his data. And no better tribute could be paid him than the homage of his secretary, who worked with him for two years, used by Christopher Morley in the *Bowling Green* in the *New York Evening Post* for Nov. 10, 1922. She goes on to say: "James Melvin Lee is author, editor, teacher and friend. At one time he was the editor of *Administration*, the *Atlantic Monthly* of business. He has written 'History of American Journalism,' 'Newspaper Practice,' etc., and is director of the department of journalism of New York University, teacher of business ethics at the same institution, and is well known as benefactor to the student."

Dr. Lee does not set himself up as a reformer, nor does he stick to the academic track in his discussion. Instead, he talks in a chatty vein, and has adopted the policy of O. Henry, who used to go through his book when completed and stick in the raisins; so has he, and with them he has scattered currents which will enliven the thought of the man in industry and help him to follow the trolley through. He does not always see it as others see it, "Swat the Lie." He goes further, and asks the question, "Does he have the moral right to know the truth?" Often he believes temptations are put in the way. A certain railway has removed a cause of friction by fixing the classification of fares for children by a

different standard than that used commonly. Children under a certain mark on the street car door are carried on the car free, but those taller than the mark pay full fare. No opportunity, therefore, is presented to patrons of the line to deceive as to the age of their children. But the key that unlocks the main thought of the book is to know all the facts of the case before one attempts to pass judgment. The problem for the reader to solve when he has finished the book is whether the business man is growing better or worse.

Motor Bus Accounting Practice

By Irville Augustus May, C.P.A. The Ronald Press, New York. 200 pages. \$6.

Until quite recently bus accounting was like Topsy; it just grew. Some there are who might question the propriety of even attributing this virtue to it, but it does seem reasonable to say that much for it. The industry was new, many of those engaged in it had little or no previous exacting business experience and even those who did lay claim to business knowledge admitted themselves to be stumped when it came to the problem of attempting to systematize the accounts.

Independent operators, the first in the new field, were not slow to recognize the accounting needs, but it was not so easy for them to act. A basis was missing upon which to build. The electric railways operating buses were somewhat better off than were the independents. Through their committee on bus accounting, composed of members of the American Electric Railway Accountants' Association, they evolved a classification of accounts for bus operating companies which Mr. May includes as an appendix to his book.

Mr. May says of his book that it has been compiled to present in convenient form the best features of the accounting systems used by some of the well-known individual automobile and bus organizations and of companies operating in the field with the idea of welding them into a simple and practicable system. In doing this he has had in mind the needs of electric railways operating buses, joint railway and motor bus companies and so-called independents.

The author recognizes the need for simplicity of accounts and has been mindful of this need in arranging his suggestions. Every one will agree with him in his statement that "whatever system is adopted, it should be not only adequate but simple and easy to operate. The individual operator may disagree with Mr. May on some of the points he mentions and may find it expedient to modify some of his suggestions, but there can be no escape from the conclusion that the author has accomplished all he set out to do.

The book is divided into eleven chapters, headed in this order: "Importance of Operating Cost Information," "In-

stalling and Operating an Automobile and Bus Accounting System," "Accounting Records in the Operating Department," "Tires and Other Supplies," "Handling Tires on Contract Basis," "Garage and Shop Costs," "Depreciation and Disposition of Worn-Out Cars," "Statistical Information," "Financial Statements," "Uniform Systems of Accounts for Automobile and Bus Accounting Practices," "Miscellaneous Accounting Forms and Methods." More than 50 forms are included in the volume. The contents of the book are, of course, especially applicable to electric railways reporting to the Interstate Commerce Commission.

Responsible operating officials everywhere may well take to heart the author's warning that poor office methods, unreliable statements and insufficient cost figures are responsible for many business failures. This warning is particularly pertinent in the bus field, where many elements, such as probable life of equipment, depreciation, obsolescence and liability features, are largely unknown quantities.

Mr. May, the author, is of course well known in the railway field as the comptroller of the Connecticut Company, as past-president of the American Electric Railway Accountants' Association and as past-president of the Connecticut State Board of Accountancy. He is the author of a volume on street-railway accounting.

The Railroad Freight Service

By Grover G. Huebner and Emory R. Johnson. D. Appleton & Company, New York. 589 pages. \$5.

Here is a book of particular interest to interurban officials engaged either in interstate or intrastate operation.

It has been written primarily to be of assistance to officials and others in the railroad service, and to those in charge of the traffic and transportation activities of industries. It describes in detail the railroad freight services, freight traffic rules and practices and the organization of the several departments by which the services are performed. It also contains an account of the organization and activities of the traffic departments connected with industries and with commercial bodies.

The presentation of each subject is detailed and comprehensive, the purpose being to present in one volume a full account of the railroad freight service. To do this it has been necessary to set forth in each chapter a large number of facts. The style is condensed, but the wealth of material to be covered has made the book a rather large volume. One impression that the book will quite certainly make upon those who read it is that the railroad freight service as a whole is a large and complicated business including a wide range of activities.

The book is essentially an account of freight services. It does not discuss the classification of freight and the making of rates. It is the hope of the authors that the book may ultimately have a companion volume dealing, in equal detail, with freight classification, rate making and rate structures.

Both of the authors are well known in the steam railroad field.

Personal Items

Key System's New President

Career of New Head of Oakland Road Reviewed—Engineer of Wide Experience

Lester Seward Ready will assume his new duties as president of the Key System Transit Company, Oakland, Cal., shortly after the first of the year, succeeding C. O. G. Miller, who becomes chairman of the board.

Mr. Ready, a resident of Berkeley, is 38 years old. He is the son of W. E. Ready, a bean and walnut rancher of Ventura County, California. He was graduated with honors from the University of California in 1912, being gold medalist of his class and having been elected to Phi Beta Kappa.

His first position after he was grad-

uated was in the engineering department of the Pacific Gas & Electric Company. In 1913 he accepted a position as an assistant engineer in the California Railroad Commission. During the past thirteen years he has held successively the positions of assistant engineer, gas and electrical engineer, assistant chief engineer and chief engineer. He has been chief engineer for the last 3½ years.

His work has included participation by him in all important gas, electric, telephone, water and street railway valuations and rate and service matters. During his incumbency as chief engineer he has supervised valuation work in connection with pending condemnation proceedings involving the electric properties of the Pacific Gas & Electric Company and the Great Western Power Company in San Francisco.

In 1918, during the war, when there was a threatened shortage of electric power in California, Mr. Ready's services were sought as state power director. At that time, however, he could not be spared from his duties with the Railroad Commission and so the job went to another, who, however, received valuable assistance from Mr. Ready. Recently he rendered special service to the East Bay communities in reporting upon the Mokelumne River controversy. It was contended by certain critics that the engineers of the East Bay utility district erred in their selection of a site for the proposed Lancha Plana dam. They contended that the dam should have been placed farther up the river than the spot designated by the district engineers. At the solicitation of the Oakland Chamber of Commerce, Mr. Ready made a study of the project and reported in favor of the district engineers. A year ago he completed a valuation report of the Los Angeles Railway system.

In announcing the change in the presidency Mr. Miller, the retiring president, explained that the transportation problem of the East Bay cities is so important and is so bound up with the life of the communities that it has been considered advisable to place in charge of the company an East Bay man who would give his entire time to the problem. In its effort to supply the East Bay cities with a service that will meet their demands the Key System is spending millions of dollars in reconstruction and the purchase of new equipment. To this end Mr. Ready will work. Mr. Miller bespoke for him the cordial support of the people who are interested in the growth of their district.

In accepting his new position Mr. Ready pledged himself to an intensive study of the problems at hand and to co-operate with the public.

W. Gerald Holmes Becomes Industrial Agent at Indianapolis

W. Gerald Holmes has resigned as director of the manufactures and new industries bureau of the Indianapolis Chamber of Commerce to become industrial agent for the Interstate Public Service Company, Indianapolis, Ind. In his new position Mr. Holmes fills the vacancy caused by the death some weeks ago of Anderson G. Moore, New Albany, Ind., industrial agent of the company for fifteen years.

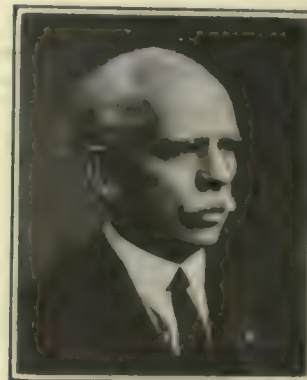
The new industrial agent became a member of the Chamber of Commerce staff on March 1, after having been connected with the bureau of business research, school of commerce, Indiana University. While with the university he conducted a number of important studies on natural resources of the state and the railway traffic rate structure. Since having charge of the Chamber of Commerce bureau he has represented the organization in the bringing of a number of new industries to Indianapolis and has made an industrial survey and a study of the industrial history of the city. His most recent work was the compilation of a booklet presenting the economic advantages of the city, with charts and pictures, which the Chamber of Commerce officials will publish and distribute in the program of developing Indianapolis industrially.

J. B. Smith Manager of Insull Properties in New Hampshire

J. Brodie Smith has been appointed vice-president and general manager of the Public Service Company of New Hampshire. He is one of the best known public utility executives in New England. He was born at Richville, N. Y., in 1861 and when only seventeen years of age built a telegraph line between two New York villages. His early manhood was spent in the drug business at Manchester, N. H., but in 1885 he was able to gratify a desire of many years to enter the electrical field, being appointed superintendent of the municipal fire-alarm telegraph system at Manchester. In 1886 he was appointed superintendent of the newly organized Ben Franklin Electric Company of Manchester, and upon its consolidation with the Manchester Electric Light Company Mr. Smith was named superintendent and director of the expanded organization. In 1896 he resigned and spent several months in Eu-



L. S. Ready



J. B. Smith

rope on business and pleasure, and upon his return was appointed general manager of the company.

In 1900 Mr. Smith became general manager of the Manchester Traction, Light & Power Company, and five years later he received also the title of vice-president. This company, with four others, was taken over Nov. 1 by the newly formed Insull property (the Public Service Company of New Hampshire), and the merged utilities will be managed by Mr. Smith under the new title. Mr. Smith is actively identified with many civic and fraternal organizations. He is as highly regarded in the electric railway field as in central-station circles.

Looking toward a closer relation between the Illinois Power & Light Company and the public and improved efficiency of operation, B. H. Peck, general manager of the Southern Illinois group, recently announced the appointment of four new division managers in that group formerly known as the Southern Illinois Division. This group

Four New Illinois Division Managers Appointed

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has been divided into four divisions, designated as A, B, C and D.

Division A, which will be in charge of George Steinwedell with office at Granite City, comprises the former East St. Louis and Granite City districts; division B, which will be in charge of A. T. Early at Belleville, comprises the former Belleville, Collinsville and Edwardsville districts; division C, in charge of A. L. Hooper at Hillsboro, comprises the former Hillsboro, Litchfield, Gillespie and Greenville districts; Division D, in charge of Carl Steinhäuser at Mount Vernon, comprises the former Mount Vernon, Centralia, Cairo, Eldorado, DuQuoin and Sparta districts.

English Honors for American Consultant

Walter Jackson, consultant on electric railway fares and service and on buses, has just received from England the gold medal awarded to him for his paper "Electric and Petrol Transport of Passengers in America," adjudged by the Council of the Institute of Transport, London, the most valuable paper of the year presented before the Institute in the Road Transport (Passenger) Department. It was donated by the London General Omnibus Company, of which Lord Ashfield, first president of the institute, is managing director. The medal is somewhat larger than a silver dollar and, of course, is much heavier. It is ornamented with a Pegasus, symbolic of the art of transportation, which was discussed in the paper. The latter was read at both a London and a provincial meeting of the institute. In it electric railway and bus practices of the United States and Great Britain were contrasted with a view of explaining the reasons for differences in method of operation and the opportunities of one country to learn from the other.

A. C. Homan of the Homan Bus Line, recently taken over by the Wisconsin Traction, Light, Heat & Power Company, Appleton, Wis., has been retained by the railway company. He will have charge of the company's bus interests at the Neenah-Menasha end of the line.

C. A. Walker, for twenty years chief electrician of the railway department of the Knoxville Power & Light Company, Knoxville, Tenn., resigned recently to accept a position with the National Pneumatic Company, New York, at its plant in Rahway, N. J. Before his affiliation with the Knoxville property he was connected with the shop forces of the Boston Elevated Railway.

S. C. Schmulbach, formerly sales manager for the Illinois Power & Light Corporation in the East St. Louis, Ill., territory, has been appointed district manager in Cairo, Mounds and Mound City. Mr. Schmulbach became connected with the company in May, 1913, as office clerk. During the past two years he has been in charge of the sales promotion and advertising departments. In his new position as district manager he will have complete charge of the street railway, gas, electric and water systems with principal offices in Cairo.

T. R. Langan Heads Metropolitan Section

Well Known Official of Westinghouse Company First Manufacturer Representative to Hold Post

Once more T. R. Langan steps up to the railway proscenium. This time it is on the occasion of the seventeenth regular meeting of the Metropolitan Section of the American Electric Railway Association, where he is elected president. Mr. Langan is known in the manufacturing as well as the operating end of the railroad business.

Tommy Langan was elected to the office of president in accordance with the avowed intention of the Metropolitan Section to accord the manufacturers full participation in the affairs of the section. He has been vice-president



T. R. Langan

during the past year, and besides acting as a member of the subjects committee has fostered the affairs of the section ever since its organization. Even as a junior in the Westinghouse organization Tommy earned for himself a reputation as a diplomat. Withal he is an industrious worker. As will be made plain later in this account of his activities, he has had just the kind of training in actual transportation service that makes him keenly appreciative of the problems of the operating officials, and so invaluable to the organization with which he is connected for his ability to interpret the point of view of the "men who run the cars."

Less than two years ago Mr. Langan was appointed manager of the transportation division of the New York office of the Westinghouse Electric & Manufacturing Company. Prior to that he had been manager of the transportation section in the Buffalo district with headquarters in Syracuse. In his New York promotion he succeeded E. J. Manson, who had been promoted to the position of manager of the heavy traction division of the railway sales department at Pittsburgh.

Mr. Langan entered the employ of the Westinghouse company in 1904 as an armature winder's helper and wireman's helper in the service department. His work from 1904 to 1906 was concentrated on the earlier installation of multiple-unit control equipments on the

Brooklyn elevated and New York subways. Then he began a special apprenticeship course at the East Pittsburgh works. A few years later Mr. Langan took up construction work in the service department and later he was made assistant general foreman of maintenance on the electric division of the New York, New Haven & Hartford Railroad, with headquarters at Stamford, Conn. In 1910 he was back again in East Pittsburgh on special service and engineering work in connection with the development of the present line of Westinghouse HL control and railway apparatus. His selling career was a reality before he went to New York in 1924, as he had met with notable success in Baltimore, Philadelphia, Buffalo and Syracuse.

The new president of the Metropolitan Section was educated at Pratt Institute, department of science and technology, Brooklyn. His studies there were correlated with his night courses at Carnegie Institute of Technology, Pittsburgh.

A. V. Guillou, who has been gas and electrical engineer of the California Railroad Commission for more than three years, has been appointed assistant chief engineer of the commission.

A. G. Mott, who has acted as transportation engineer of the California Railroad Commission for the past three years, has been appointed chief engineer of the commission to succeed Lester S. Ready.

Obituary

Virgil R. Powell, vice-president and general manager of the Peoples Railway, Dayton, Ohio, died on Nov. 9 of pneumonia. He was sick only three days. Mr. Powell had been a resident of Dayton for the past 27 years. He entered the employ of the Peoples Railway as a conductor 27 years ago. He was born at Mechanicsburg, Ohio, on Aug. 31, 1879.

Ellis R. Swan, formerly superintendent of the Olneyville Division of the United Electric Railways, Providence, R. I., died recently in South Milford, Mass. Mr. Swan went to work for the United Railways in 1866 and continued in its employ for 44 years, when he was retired on pension, at the age of 70. A glowing tribute was paid to this veteran railway man by the Providence Journal on Dec. 24, 1902, in connection with a presentation of a gold watch and chain by his fellow employees.

Anderson G. Moore, for several years industrial agent of the Interstate Public Service Company, Indianapolis, Ind., died on Sept. 28. Mr. Moore began his career as an industrial agent in New Albany, Ind., several years ago. He succeeded in locating many important industries not only in New Albany and Jeffersonville but for other cities served by the Interstate Public Service Company. Shortly after he took up his residence in New Albany, 25 years ago, Mr. Moore became associated with the old Louisville & Southern Indiana Traction Company and the Louisville & Northern Railway & Lighting Company, which was absorbed by the Interstate.

Manufactures and the Markets

News of and for Manufacturers—Market and Trade Conditions
A Department Open to Railways and Manufacturers
for Discussion of Manufacturing and Sales Matters

World Trade Discussed by Owen D. Young

Urges Americans to Attend International Congress at Stockholm
Next June

Owen D. Young, chairman of the American committee of the International Chamber of Commerce, is urging affiliated organizations in this country to send a large and representative delegation to the general meeting of the chamber to be held at Stockholm, Sweden, next June. A report making definite recommendations for the elimination of trade barriers will be the main topic for consideration at this world-wide gathering of business men.

Mr. Young says that "the business men of the world must understand one another. They must learn to co-operate with one another. They must learn to have confidence in one another. Somewhere there must be a meeting place common to business men everywhere, whatever language they speak, under whatever laws they operate—a place where they can meet and discuss their problems.

The Stockholm meeting "will bring together business men of the 40 countries represented in its membership." Moreover, it will address itself to important economic problems of world-wide interest, in the correct solution of which no one has a greater concern than the business men of the United States.

In view of the recent discussion of the trade barrier problem, it is anticipated that this subject will attract a great deal of interest at Stockholm. This whole question will come before the Stockholm meeting in the form of a report drafted by a central trade barriers committee of the international chamber. This report will offer definite conclusions and recommendations for the removal or modification of trade barriers which hinder the free flow of commerce among the nations.

The American committee on this subject points to a number of trade barriers to which in its opinion attention should be given. Among these are double taxation, lack of international protection of patents, trademarks and designs, lack of centralized credit information, lack of uniformity in commercial letters of credit, inadequacy of the international parcel post, antiquated customs classifications and cumbersome and complicated customs formalities. Julius H. Barnes, chairman of the American committee, said that "it is certain the American delegation will allow there no move to bring about any action looking to a lowering of America's tariff such as would destroy the protection which American workers now enjoy." He explained that the United States is in a position different

from Europe with respect to tariffs in that we have here a great buying territory which is able to purchase the output of our great factories without the bar of tariff walls.

First Cincinnati Car Dividend— Officers Announced

A dividend of 35 cents a share on the no-par common shares of the Cincinnati Car Company, Cincinnati, Ohio, was announced following the initial meeting on Nov. 5 of the directors since the reorganization of the company, which acquired all of the assets of the Ohio Traction Company. The dividend will be paid on Jan. 1 to stockholders of record Dec. 20. A resolution also was passed to list the stock on the Cincinnati Stock Exchange. W. Kesley Schoepf, former president of the Ohio Traction Company, was elected president. Other officers chosen were: H. J. Sanders, vice-president and treasurer; A. L. Kassmeyer, vice-president in charge of sales, and E. C. Bernhold, secretary and assistant treasurer. Directors elected are as follows: Mr. Schoepf, Louis J. Hauck, H. M. Levy, Charles J. Livingood, H. A. Worcester, Casper H. Rowe, Joseph B. Verkamp, H. B. Vorhees, H. L. Sanders, Edward C. Wettengel, T. H. Schoepf, Gustav A. Weil, Thomas Elliott, W. F. Wiley and Frederick H. Hertenstein.

Storage-Battery Locomotive Has Gas-Electric Auxiliary

Weighing 110 tons and capable of hauling a 1,500-ton train, equivalent to 70 empty or 30 loaded freight cars, at a speed of from 8 to 10 m.p.h., the largest storage-battery locomotive in the world is now in service in Chicago. It will be used for some time in the freight yards of the Chicago & Northwestern Railway to demonstrate its possibilities in solving some of the problems of railroad terminal electrification in that city. It made the 450-

mile trip from the Erie, Pa., works of the General Electric Company under its own power, with a stop at Cleveland for exhibition at the American Electric Railway Association convention. The locomotive incorporates both the storage-battery and gas-electric drive, and has a number of novel features which make it particularly adaptable to switching service. An Exide Ironclad battery of 120 cells is used.

The control is so arranged that power can be taken entirely from the storage battery, or the gas-electric drive can be used. If more power is needed than is being supplied by the gas-electric unit, the storage battery supplies energy in parallel with the engine-driven set; if the gas-electric unit is supplying more power than is required by the motor the excess automatically charges the storage battery. In switching service the battery can thus be used to supply power, with the gas-electric unit used during slack periods to keep the battery charged. The storage battery can also be recharged by outside power.

The problem of electrifying the railroads in Chicago has been studied by most of the prominent electrical and railroad engineers of the country during the past decade. Several of these engineers expressed their belief that locomotives of the storage battery type may be used to advantage for switching service in various sections of Chicago.

It is planned to subject this rather hybrid unit to a series of exhaustive tests and thus to develop experimentally its most effective field of service.

The following table gives the principal weights, dimensions and other data for this locomotive:

Weights

Locomotive, complete	237,000 lb.
Mechanical equipment	100,700 lb.
Battery	78,960 lb.
Motor	29,800 lb.
Engine and generator	7,850 lb.
Radiator and fan	3,500 lb.
Control	9,150 lb.
Brakes	5,640 lb.
Heater	1,400 lb.

Dimensions

Length over all	52 ft. 0 in.
Wheelbase	39 ft. 0 in.
Rigid wheelbase	8 ft. 0 in.
Height	14 ft. 8 in.
Width	10 ft. 0 in.
Tractive effort, one-hour capacity	17,200 lb.
Speed at one hour rating	9½ m.p.h.
Tractive effort, 30 per cent coefficient of adhesion	66,000 lb.
Maximum speed	30 m.p.h.
Time motors will carry maximum tractive effort	9 minutes



This Storage-Battery Locomotive Was Exhibited at the Cleveland Convention on Its Way to Chicago

New York "Post" Is Unconvinced

It Doesn't Believe Electric Railway Manufacturers Use Liquor Extensively to Stimulate Sales at Conventions

From various sources editorial comment has been elicited in response to Gen. Lincoln C. Andrews' recent open letter appealing for manufacturer co-operation in stemming the alleged use of liquor at conventions to stimulate sales. The text of General Andrews' communication was published in the issue of *ELECTRIC RAILWAY JOURNAL* for Nov. 6, page 869. Particular exception to the remarks which the prohibition director made with respect to the electric railway industry is taken by the *New York Post*, on the editorial page of which for Nov. 3 appears the following:

It will be interesting to learn what the manufacturers of the country think of General Andrews' discovery that their agents spend large sums of money for liquors with which to entertain their prospective customers. There has been a widespread impression that competition had become so keen that the man who was formerly known as "the cocktail member of the firm" had been eliminated. To prove his case General Andrews says that when he was in the street railway business the agents of street railway supply houses dispensed unlimited quantities of liquor in furthering the interests of their concerns. That must have been some time ago. Dealers in street railway supplies in recent years have had to change their ways. Buses and automobiles have curtailed the revenues of street railways and forced the traction managers to limit their purchases to their actual necessities and to buy closely. As a rule, the business is now done by bid and contract, which prevents the supply houses from adding liquor charges to the cost of their goods. The statement that the representatives of manufacturing concerns at their annual conventions are prone to entertain each other with liquor will hardly be disputed. But that is true of all sorts of conventions and is more of a social than a business matter. At such assemblages, as elsewhere, those who want to drink can usually find some one to drink with them.

Recent Orders for Supervisory Control Equipment

For installation in a new switching station at Hempstead Crossing, Long Island, the Long Island Railroad has ordered its third set of Westinghouse audible-type supervisory control equipment. The equipment will be the first audible-type supervisory control equipment to have the substation equipment panel mounted. It will form one section of the switchboard, and is to be

used for the control of circuit breakers feeding the third-rail system. The substation will be situated at the intersection of two of the many lines of this company covering the lower part of the island. This substation is being installed to take the place of a smaller company's lines, which will insure fewer and less extensive interruptions to the power supply for the third rail.

In an order received from the Connecticut Light & Power Company a large number of standard Westinghouse supervisory control protective units are called for to be connected to the supervisory control wires. This will protect the supervisory relays from excessive voltage induced by surges on the transmission line which parallels the supervisory line.

The Penn Public Service Company of Johnstown, Pa., intends to control its Reeder Street substation by means of Westinghouse synchronous visual supervisory control equipment. The equipment will be arranged to control fourteen circuit-breakers at the present time, but provisions will be made for controlling four additional breakers at some future date.

Details of Pennsylvania's Order of Electrical Equipment

In addition to the electrical equipment for 93 cars which was recently ordered by the Pennsylvania Railroad from the Westinghouse Electric & Manufacturing Company, East Pittsburgh, Pa., as specified in the issue of *ELECTRIC RAILWAY JOURNAL* for Oct. 9, 1926, apparatus for 30 cars has been ordered from the General Electric Company, Schenectady, N. Y., and apparatus for five cars from the American Brown Boveri Electric Corporation, New York, N. Y. This makes a total of 128 electric passenger cars which are being secured for operation over the Southern Division main line between Philadelphia and Wilmington, Del., and the Octoraro branch between Philadelphia and West Chester, Pa. Extensive progress is being made on the work of electrifying these lines and the new equipment for them is expected to be delivered by November, 1927.

It was also reported in *ELECTRIC RAILWAY JOURNAL* on Oct. 9 that the Pennsylvania Railroad had contracted for the electrical equipment to be used in the construction of four new locomotives to be operated in passenger service between Pennsylvania Station, New York City, and Manhattan Transfer, N. J. These four units, which were ordered from the Westinghouse Electric & Manufacturing Company, will be supplemented by four from the General Electric Company, all to be of the same general type. Delivery of this locomotive equipment is expected by September, 1927.

The electrification work between Philadelphia and Wilmington and Philadelphia and West Chester constitutes one of the most important projects of its kind undertaken in recent years. It involves approximately 52 miles of line and 150 miles of track. Its consummation will give the Pennsylvania Railroad a total of 90 miles of

line and 264 miles of track electrified for suburban service directly in and out of Philadelphia. In addition, the Camden-Atlantic City electric line provides Philadelphia with an extensive suburban service via the Delaware River ferries.

The electrification projects to Wilmington and West Chester are an integral part of the Pennsylvania Railroad's plan for its new main Philadelphia passenger station on the west bank of the Schuylkill River and the extension of electric suburban service into a centrally located underground terminal near the site of the present Broad Street Station in Philadelphia.

Rolling Stock

Northern Ohio Power & Light Company, Akron, Ohio, has purchased five of the new model six-cylinder, 29-passenger parlor car buses from the International Motor Company, New York, N. Y. This is the first company in this district to order the newest model Mack bus. The units will operate on the Akron-Cleveland-Canton route, a distance of 68 miles. The bodies on these five buses were built by the Lang Body Company. Special leather upholstery and seats have been installed and the further item of special shatter-proof glass has been used throughout.

New Orleans Public Service, Inc., New Orleans, La., recently received two six-cylinder gas-electric chassis from the Fageol Company of Kent, Ohio.

Track and Line

Milwaukee Electric Railway & Light Company, Milwaukee, Wis., has completed the construction of the Center Street extension from 51st Street to 60th Street.

Seattle, Wash.—The Municipal Railway Department will receive bids until Nov. 26 for 4½ miles of 50 to 70-lb. rail, also for 12,000 cross-ties, hewn or sawed.

Madison Railways, Madison, Wis., will improve its track zones on Winnebago Street from the Yahara River to the Northwestern road tracks and at two points on its Atwood Avenue line from Winnebago Street to Division Street and from Ohio to Fair Avenue.

New Advertising Literature

Westinghouse Electric & Manufacturing Company, East Pittsburgh, Pa., has issued leaflet No. 20133-A, describing the type SK steel-clad distribution transformers. Detailed information is given on the outstanding features of the application and construction of this type of transformers, bringing out the new type of bushing that is being used in the construction.

Ohmer Fare Register Company, Dayton, Ohio, has issued a circular which describes the Ohmer odometer, a mileage counter which is particularly designed for use on buses and trucks.

Metal, Coal and Material Prices

Metals—New York		Nov. 9, 1926
Copper, electrolytic, cents per lb.	13.60	
Copper wire, cents per lb.	16.00	
Lead, cents per lb.	8.00	
Zinc, cents per lb.	7.55	
Tin, Straits, cents per lb.	70.75	
Bituminous coal, f.o.b. Mines		
Smokeless mine run, f.o.b. vessel, Hampton Roads, gross tons	\$10.00	
Somerset mine run, Boston, net tons	4.00	
Pittsburgh mine run, Pittsburgh, net tons	3.50	
Franklin, Ill., screenings, Chicago, net tons	1.875	
Central, Ill., screenings, Chicago, net tons	1.725	
Kansas screenings, Kansas City, net tons	2.35	
Materials		
Rubber-covered wire, N. Y., No. 14, per 1,000 ft.	\$6.00	
Weatherproof wire base, N. Y., cents per lb.	17.50	
Cement, Chicago net prices, without bags	2.17	
Linseed oil, (5-bbl. lot), N. Y., cents per lb.	11.53	
White lead in oil (100-lb. keg), N. Y., cents per lb.	15.25	
Turpentine (bbl. lot), N. Y., per gal.	\$0.90	

“Hold-’em—
Hold-’em—
Hold-’em!”

Football season and all its thrills is here. The anxiety as to whether your Alma Mater will be able to “hold-’em” once more is causing you concern.

Not so to the operators of modern cars equipped with

Peacock Staffless Brakes

Cars thus equipped cause their operators no anxiety because they *know* that Peacock Brakes will “hold-’em” in any emergency. They have three times the braking capacity of ordinary hand brakes. Installation and maintenance costs are low. They are simple to operate. They occupy minimum platform space. They have a 144-in. chain winding capacity insuring adequate braking power even though brake shoes are worn and brake rigging is loose.

There are other factors that make Peacock Staffless Brakes adaptable to the most modern cars. Let us tell you about them.

NATIONAL BRAKE CO., Inc.

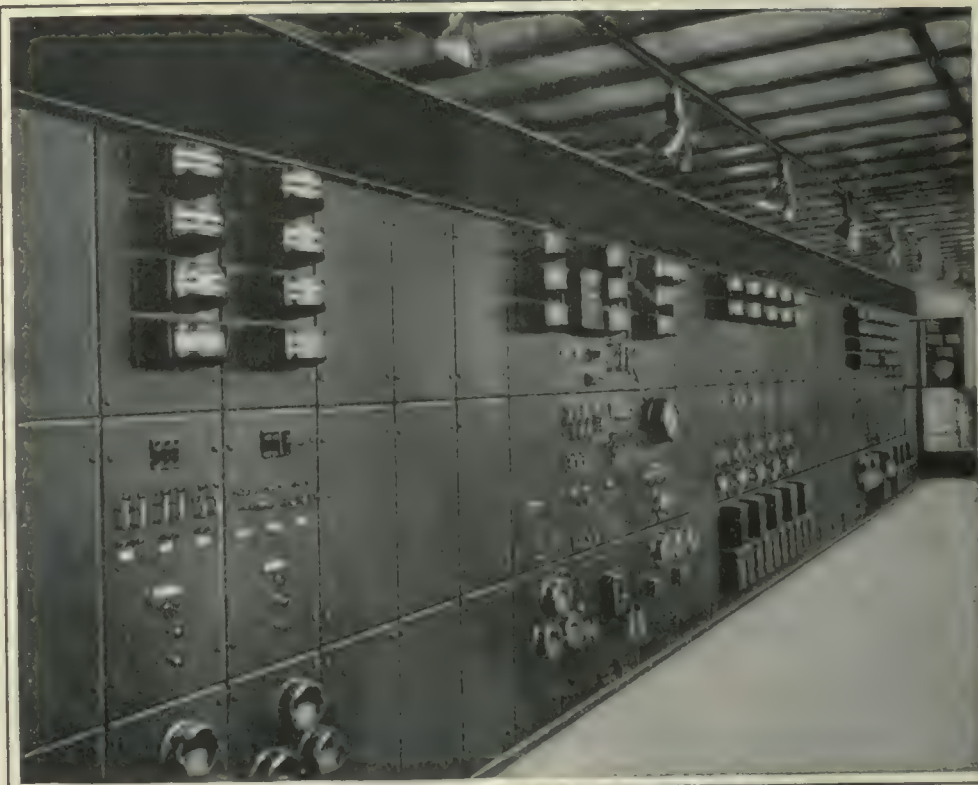
890 Ellicott Sq., Buffalo, N. Y.

Canada:—Lyman Tube & Supply Co., Ltd., Montreal



The
Peacock
Staffless

Asbestos Ebony



Asbestos Ebony Panels; switchboard of Public Service Company of Northern Illinois, Evanston substation.

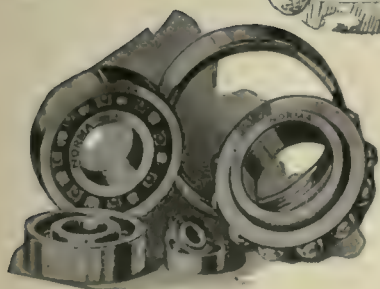
ASBESTOS Ebony Panels are extensively used for switch and panel boards because their great dielectric and physical strength is not handicapped with the excessive weight prevailing in quarried materials. Because Asbestos Ebony is manufactured, not mined, it is totally free from metallic veins and retains its deep black lustre through years of extreme service conditions.

JOHNS-MANVILLE, Inc., 292 Madison Avenue, at 41st Street, New York City
Branches in all large cities. For Canada: CANADIAN JOHNS-MANVILLE, Ltd., Toronto.

JOHNS-MANVILLE



For Traction Motors and Motor Busses



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PRECISION
BALL BEARINGS

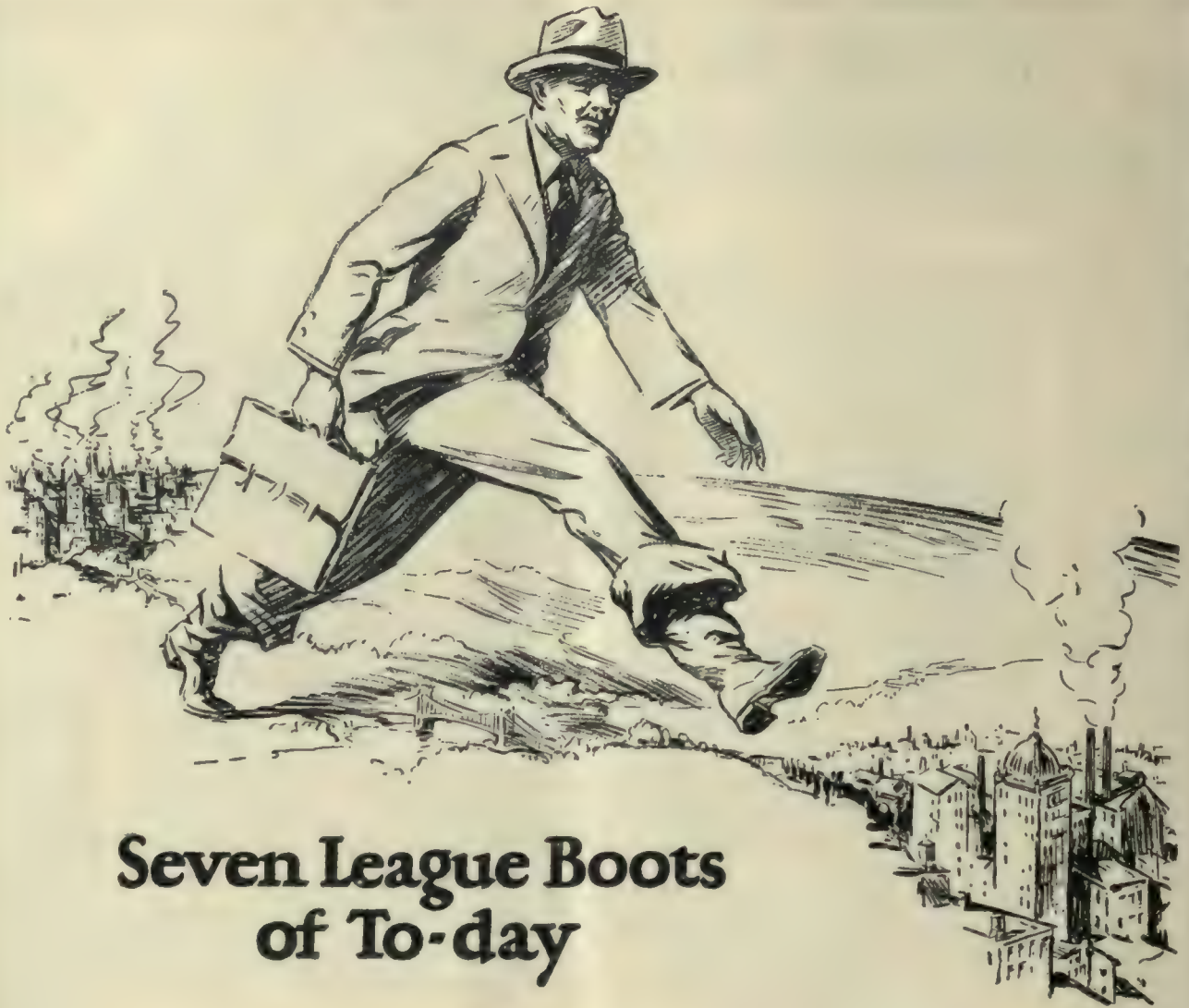
These high-speed, high-duty bearings—in bus generators and ignition apparatus—continue to be the standards in electrical equipment of proved dependability.

THE hammer-like blows of road shocks—the heavy overloads of starting—the heat, dust, moisture—the hazards of winter operation—all are as nothing to the sturdy "HOFFMANN" Roller Bearing. It stands up.

With its big, solid rollers and heavy races of hardened, heat-treated alloy steel—with its unmatched precision—with its dust-and-moisture-proof mounting and magazine lubrication—it has that big reserve of endurance which stands up under the heaviest loads and hardest service of traction duty.

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"HOFFMANN"
PRECISION
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VITRIFIED brick has always had every argument in its favor as the right paving material for electric railway service—*durability* under traffic—easy *removability* for track changes and repairs—100% *salvage*. First cost has frequently led to the choice of less completely suitable substitutes. Today the cost situation is changed.

The Arlington Test

recently completed by the government, outside of Washington, D. C., has sweepingly established the entire adequacy of THINNER BRICK PAVEMENTS to meet every condition of heavy, modern traffic and tonnage.

Two-and-one-half Inch Brick

gives a more economical but adequately enduring pavement. *Let us send you a copy of the official performance figures and records of the Arlington test.*

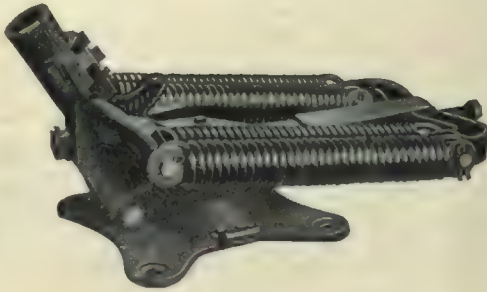
NATIONAL PAVING BRICK
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for electric railway service



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The new
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 Timken Roller Bearing Trolley Base

A really new trolley base, simplified and engineered to the same high standards of efficiency and low maintenance as the modern car motor. Incorporates the famous Timken Roller Bearing—a tapered double-race roller bearing designed by this manufacturer especially for trolley base service.

Profitably interesting features include extreme sensitiveness, with swiveling strains evenly distributed on bearings; oil and grease reservoirs for lubrication of bearings and pole socket axle pin respectively; quick, easy lubrication only once in six months.

Full specifications on request.



1926

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He constructs for himself an ingenious telescope to spy out the wonders of the ocean bed.

It's simply a large tin can with a sheet of glass on one side.

It works—so he's satisfied.

Now let us change the scene to a plant equipped with misfit carbon brushes.

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The answer to which is a long story which you can get by calling in one of the representatives below:

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Cincinnati, Electrical Engineering & Mfg. Co., 607 Mercantile Library Building.

Cleveland, Electrical Engineering & Mfg. Co., 422 Union Building.

Baltimore, O. T. Hall, Sales Engineer, 437-A Equitable Building.

Revere, Mass., J. F. Drummey, 75 Pleasant Street.

Los Angeles, Special Service Sales Co., 502 Delta Building.

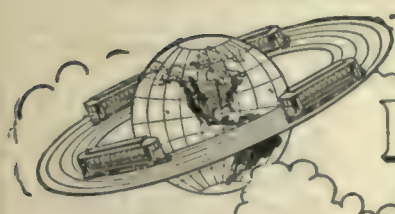
San Francisco, Special Service Sales Co., 222 Underwood Building, 545 Market Street.

Toronto, Can., Railway & Power Engineering Corp., Ltd., 101 Eastern Ave.

Montreal, Can., Railway & Power Engineering Corp., Ltd., 326 Craig St., West.

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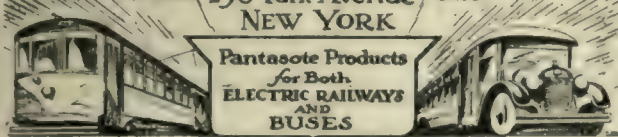
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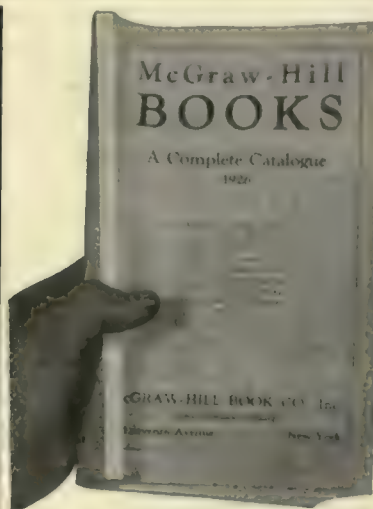
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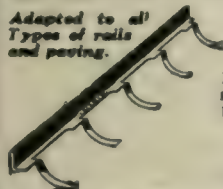
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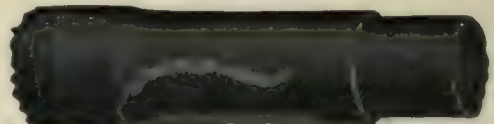
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(Continued on page 34)

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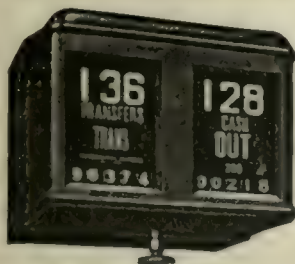
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Electric Service Supplies Co.
Wood Co., Chas. N.
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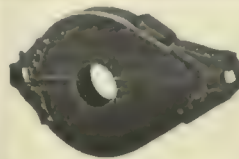
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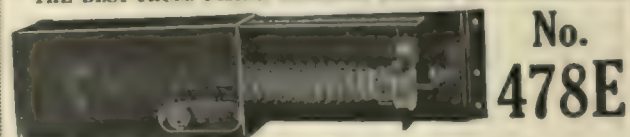


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ALPHABETICAL INDEX TO ADVERTISEMENTS

Page	Page	Page	Page
American Brass Co., The..... 35	Ford, Bacon & Davis..... 28	Kelker, DeLew & Co..... 28	Rail Joint Co., The..... 30
American Bridge Co..... 26	"For Sale" Ads..... 31	Kelly-Springfield Tire Co..... 16	Railway Track-work Co..... 33
American Car Co..... 37		Kuhlman Car Co..... 37	Railway Utility Co..... 33
American Electrical Works..... 33			Tamapo Ajax Corp..... 35
American Steel Foundries..... 6			Richey, Albert..... 28
American Steel & Wire Co..... 33	General Electric Co., 18, Back Cover	LeCarbone Co..... 27	Roebbling's Sons Co., John A..... 35
Anaconda Copper Mining Co..... 35	Godwin Co., Inc., W. S..... 29	Lorain Steel Co..... 26	
Archbold-Brady Co..... 28	Gold Car Heating & Ltg. Co..... 35	Ludlum Steel Co..... 26	
	Goodyear Tire & Rubber Co.,		
Babcock & Wilcox Co..... 30	The..... 12		
Beeler Organization..... 28	Graham Bros..... 10	McClellan & Junkersfeld..... 28	Samson Cordage Works..... 35
Bell Lumber Co..... 35	Graybar Electric Co..... 14	McGraw-Hill Book Co..... 27	Sanderson & Porter..... 28
Bemis Car Truck Co..... 30		Metal & Thermit Corp..... 29	Searchlight Section..... 31
Bethlehem Steel Co..... 26		Morganite Brush Co..... 24	Six Wheel Co..... 31
Brill Co., The J. G..... 37	Hale-Kilburn Co..... 29		Smith Heater Co., Peter..... 35
Buchanan & Layng Corp..... 28	Haskelite Mfg. Corp..... 29		Standard Underground Cable Co..... 33
Buda Co., The..... 26	"Help Wanted" Ads..... 31		Star Brass Works..... 33
Bylesby Eng & Management	Hemphill & Wells..... 28	Nachod and U. S. Signal Co..... 33	Stevens & Wood, Inc..... 28
Corp..... 28	Holst, Englehardt, W..... 28	National Brake Co..... 19	Stone & Webster..... 28
	Hornblower & Weeks..... 29	National Paving Brick Mfrs.	Stucki Co., A..... 33
	Hubbard & Co..... 36	Aaso..... 23	
Cameron Electrical Mfg Co..... 35	Hudson River & Eastern Traction	National Pneumatic Co..... 11	Una Welding & Bonding Co..... 29
Carnegie Steel Co..... 26	Co..... 31	National Ry. Appliance Co..... 30	United States Tire & Rubber Co.,
Chillingworth Mfg. Co..... 35		Naugle Pole & Tie Co..... 35	Front Cover
Cincinnati Car Co..... 13	Illinois Steel Co..... 8	Norman-Hoffmann Bearing Corp..... 21	Universal Lubricating Co..... 30
Cleveland Fare Box Co..... 29	International Register Co..... 3	Nuttall Co., B. D..... 24	
Cleveland Pneumatic Tool Co..... 15	International Steel Tie Co., The..... 7		Van Loan Corp., Irving S..... 31
Collier, Inc., Barron G..... 25	Irvington Varnish & Insulator	Ohio Brass Co..... 5	"Want" Ads..... 31
Consolidated Car Fender Co..... 35	Co..... 33	Okonite-Callender Cable Com-	Wason Mfg. Co..... 37
Consolidated Car Heating Co..... 35		pany, Inc., The..... 36	Westinghouse Elec. & Mfg. Co..... 2
		Okonite Co., The..... 36	Westinghouse Traction Brake Co. 4
Day & Zimmermann, Inc..... 28	Jackson, Walter..... 28		Wharton, Jr. & Co., Inc., Wm. 26
Differential Steel Car Co., The..... 30	Jeandron, W. J..... 27	Pantasote Co., Inc..... 27	"What and Where to Buy"..... 32, 34, 36
	Johnson & Co., J. R..... 29	Perey Mfg. Co., Inc..... 35	White Co., The..... 17
Electric Ry. Equipment Co..... 30	Johns-Manville, Inc..... 20	Positions Wanted and Vacant..... 31	White Eng. Corp., The J. G..... 28
Electric Railway Improvement			Wish Service, The P. Edw..... 29
Co., The..... 35			Wood Co., Chas. N..... 35
Electric Service Supplies Co..... 9			

Continued from page 34

Trolley Material, Overhead Electric Service Supplies Co. Ohio Brass Co. Westinghouse E. & M. Co.	Tube, Yellow & Black Flexible Varnish Irvington Varnish & Ins. Co.	Waterproofing Johns-Manville Co.	Welding Steel Electric Railway Improve- ment Co.	Wheels, Wrought Steel Carnegie Steel Co. Illinois Steel Co. Ludlum Steel Co.
Trolley Wheel Bushings Star Brass Works	Turbines, Steam General Electric Co. Westinghouse E. & M. Co.	Welded Rail Joints Electric Railway Improve- ment Co.	Railway Trackwork Co. Una Welding & Bonding Co.	
Trolley Wheels & Harps Electric Service Supplies Co. Star Brass Works	Turnstiles Electric Service Supplies Co. Perey Mfg. Co., Inc.	Metal & Thermit Corp. Ohio Brass Co.	Welding Wire American Steel & Wire Co. General Electric Co.	Whistles, Air General Electric Co. Ohio Brass Co.
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Trucks, Car Bemis Car Truck Co. Brill Co., The J. G. Cincinnati Car Co.	Ventilators, Car Brill Co., The J. G. Cincinnati Car Co. Consolidated Car Heating Co.	Railway Trackwork Co. Una Welding & Bonding Co. Westinghouse E. & M. Co.	Wheel Presses (See Machine Tools)	Wire Rope American Steel & Wire Co. Roebbling's Sons Co., J. A.
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	Old Cars	New Cars
Way and Structures	7.05c.	6.50c.
Maintenance of Equipment	5.71	4.70
Power	3.42	0.70
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says:

"The Gas Electric Bus
has passed beyond
the experimental
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Albany, N. Y. A subsidiary company,
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Company operates gas-electric buses.

Enthusiasm grows for the Gas-Electric Bus

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ELECTRIC RAILWAY JOURNAL

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This past Summer the Washington Railway and Electric Company installed Steel Twin Tie Track on North Capitol Street for a combina-

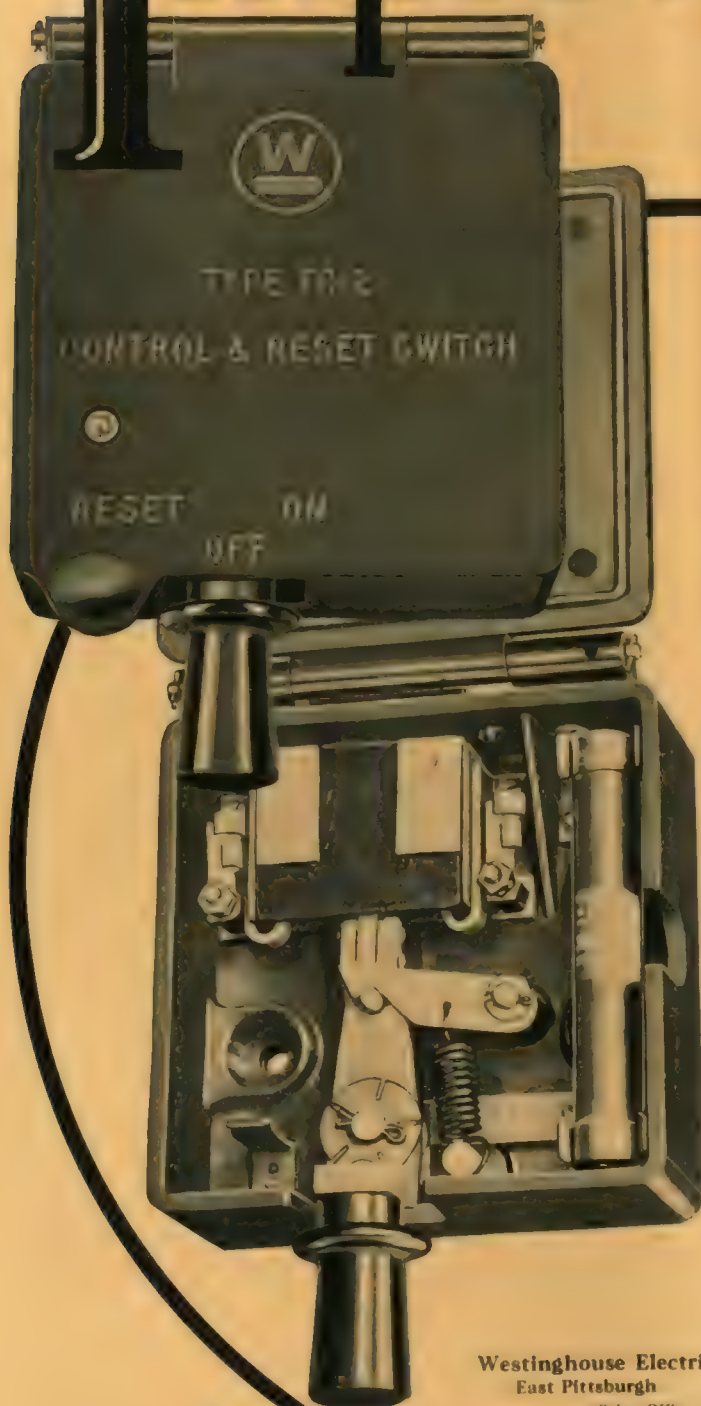
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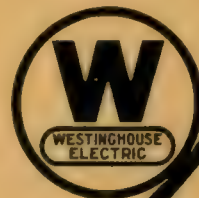
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Vol. 68
No. 21

CONTENTS

Pages
913-952

NOVEMBER 20, 1926

Editorials913

Attractive Overhauling Shop Completed in Fort Wayne916

Large building of red brick added to group comprising Spy Run shops of Indiana Service Corporation. Novel pit construction used. Overhead crane and I-beam traveling hoist system provide for efficient handling of equipment. Machine tools with individual motor drive.

Old Signal Bells Ring Again in Los Angeles.....922

Accurate Machining of the Vs of Assembled Commutators Is Essential923

By JESSE M. ZIMMERMAN.

By machining the Vs of assembled commutator segments to a smaller gage diameter, high bars experienced with arch-bound commutators are eliminated. Careful gaging and testing insures accurate workmanship.

Duisburg Installs Articulated Car.....926

Building Up Worn Surfaces by Welding927

By W. L. HARWOOD.

This is the largest field for the welding process in the railway shop. Worn surfaces of yokes, brake rigging, brake heads, journal boxes and all truck parts can be built up to good advantage. Motor frames and housings offer large field for economical repairs.

Light Steel Tie Construction Used at El Paso.....929

Northern Ohio Modernizes Cars930

Maintenance Notes931

Air Operated Third Rail Steel Scraper931

Preventing Vibration of Armature Coils931

Lockers Used for Storage of Paints.....931

Bearing Flanges Rounded Quickly932

Dick Prescott Simplifies Maintenance932

Overhauling Methods of the Pacific Electric Railway—

By F. E. Geibel.....933

Locked Receptacle for Transporting Small Package Goods.....933

Preventing Oxidation of Air Tanks Under Hangers.....934

Another Use for the Sand Blast.....934

New Equipment Available934

Portable Air Compressor934

Automatic Feed Machine for Arc Welding.....934

Portable Workbench Saves Steps935

Portable Electric Speed Buffer935

Association News and Discussion936

Reports Before Utility Commissioners Touch on Important Local Transportation Subjects.....936

Regulation and Snow Fighting Discussed at Wisconsin Bus Meeting939

News of the Industry.....940

Recent Bus Developments944

Financial and Corporate946

Personal Mention949

Manufactures and the Markets950

R. S. V. P.

EVERY electric railway man is interested in the annual industry statistics published by ELECTRIC RAILWAY JOURNAL in the first issue of each year. These figures are quoted far and wide as showing the progress during the preceding twelvemonth and forecasting the future. Their great value is due to the care exercised by officials of electric railways all over the United States and Canada, in furnishing data concerning their own individual properties.

Letters requesting figures for use in the statistical number of the JOURNAL, to be published Jan. 1, 1927, are now being mailed. Doubtless many will be received before this message is read. Others will be delivered soon thereafter. Altogether more than 700 railways will be asked for information.

In previous years the promptness and completeness of the responses have been most gratifying. It is our hope that through the co-operation of the industry, ELECTRIC RAILWAY JOURNAL will be able to publish on the first of next year even more complete figures than those of previous years.

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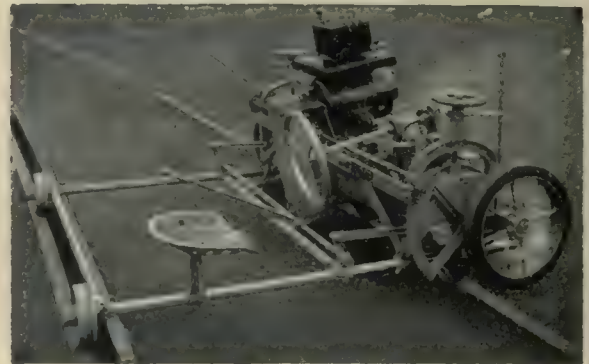
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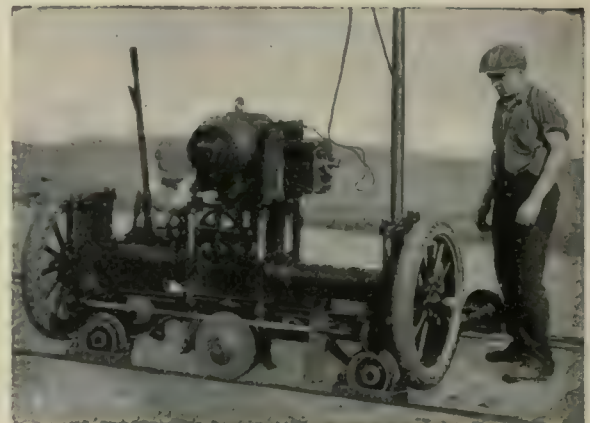
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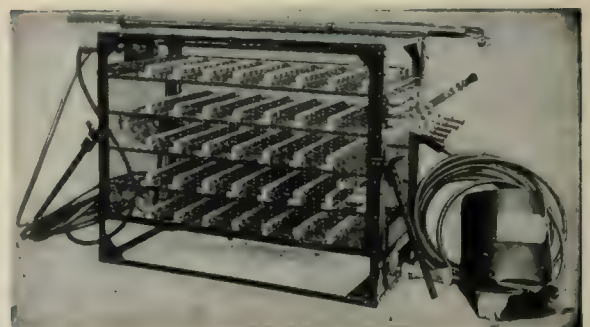
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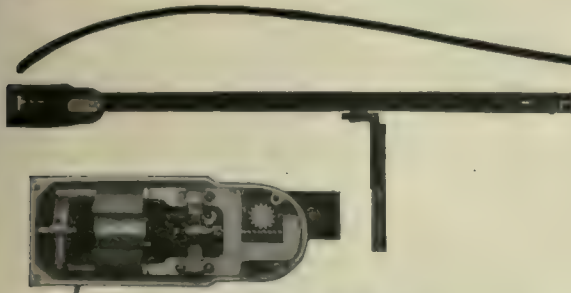
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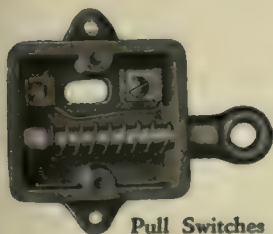
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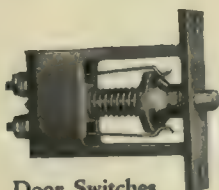
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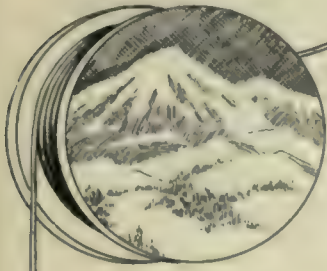
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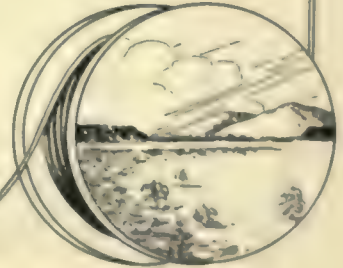
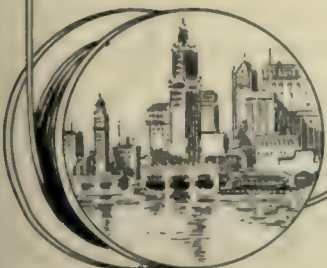
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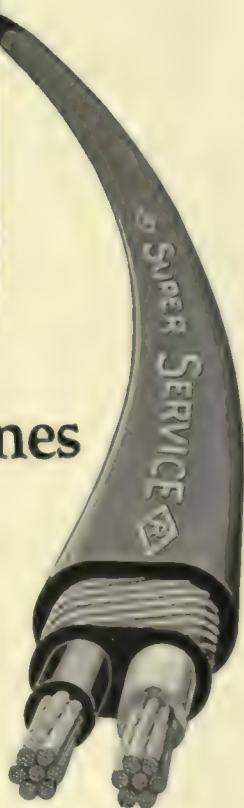
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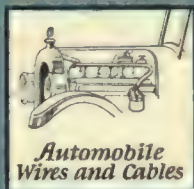
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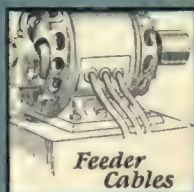
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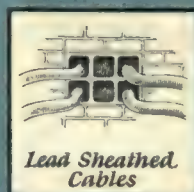
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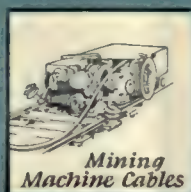
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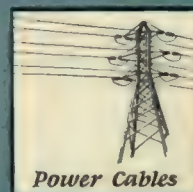
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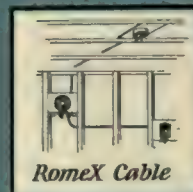
Slow Burning
Wires



Super Service
Cords and Cables



Rubber Covered
Wires—Code 30%
Intermediate



RomeX Cable



Copper Rod and
Bare Copper Wire

Why the Circulating Load?



With increased blocking and congestion caused by peak load traffic, some way *had* to be evolved in which to handle passengers with less inconvenience and delay. The solution was found in loading at the front and discharging at the rear—a system which required special mechanism for the operation of car doors. The National Pneumatic Company, therefore, evolved the ***Automatic Treadle Exit Door***—a mechanism which has made it possible to circulate your load efficiently on both one and two-man cars.

NATIONAL PNEUMATIC COMPANY

Executive Office, 50 Church Street, New York

General Works, Rahway, New Jersey

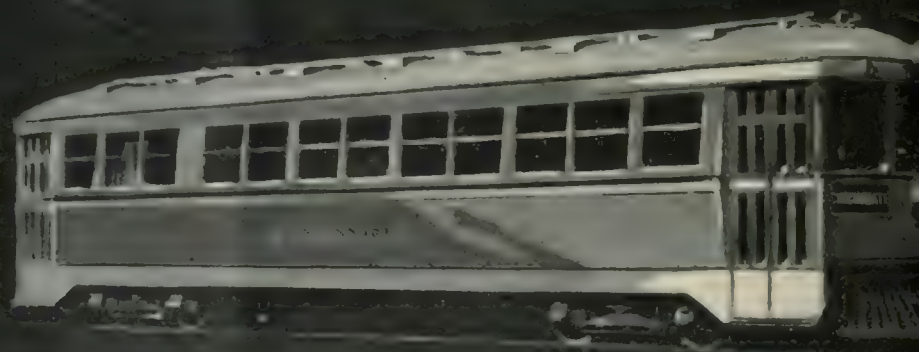
CHICAGO
518 McCormick Building

MANUFACTURED IN
TORONTO, CANADA, BY
Railway & Power Engineering Corp., Ltd.

PHILADELPHIA
1010 Colonial Trust Building



Here are
BEAUTY
SPEED *and*
COMFORT



made doubly valuable by sound operating economy

In one case the saving was 7.4%, in another 19.6%, and in yet another 37%—on total operating cost per car mile.

The appeal of appearance! Passenger preference! Public interest and friendship!

Such phrases as these clearly indicated the trend of thought at the Convention. It is not enough to have new cars built in accordance with the ideas of a past generation. They must be new in spirit as well as fact. They must be different—*strikingly different*—from the traditional "trolley car."

Such is the only basis on which public interest and friendship can be won!

And it is a fundamental of BAL-

ANCED DESIGN—to build cars so carefully *balanced* in every detail of construction and finish, so attractive, so thoroughly modern, that public approval becomes a certainty.

But BALANCED DESIGN goes even further than this. It establishes a principle of car construction which has definitely proved its soundness from the viewpoint of operating cost as well as passenger preference. When you buy your new cars this way, you make no experiments. Results can be predicted with more than usual accuracy.

THE CINCINNATI CAR COMPANY
CINCINNATI, OHIO

CINCINNATI
New
CARS

A step ahead of the modern trend

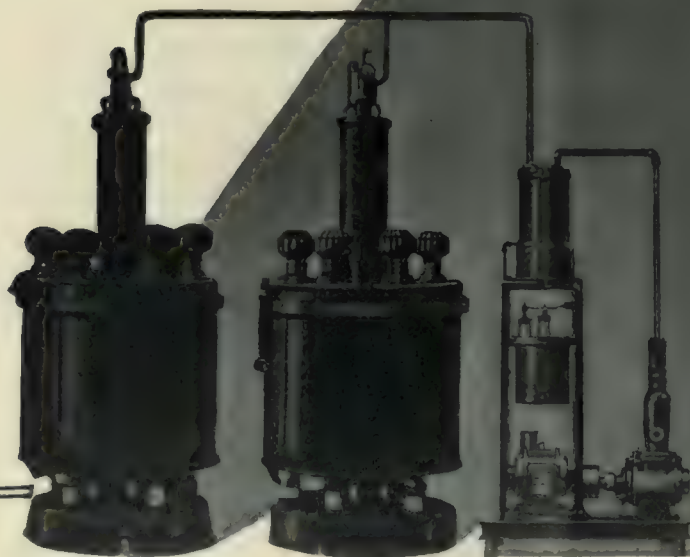
American BROWN BOVERI

7. NOISELESS OPERATION

Chief Advantages

1. Efficiency high over the whole working range.
2. Simple operation and minimum attention.
3. No synchronizing.
4. Very high momentary overload capacity and insensibility to short circuits.
5. Negligible maintenance.
6. Low weight. No special foundations.
7. Noiseless and vibrationless operation, consequently rectifier sub-stations can be erected in densely populated localities.
8. New sub-stations need only be of light construction. In many cases old houses can be converted while the plant can often be erected in places that could not be considered for rotating machinery.

Steel enclosed—
no glass parts



Descriptive Cir-
301 describes A-
cury-Arc Power

Principal Products

Mercury-Arc Power Rectifiers
(steel enclosed)

Electric Locomotives—for any
system of current, high or
low tensions

Complete equipment for rail-
way electrification

Rotary Converters

Motor Generators

Diesel-Electric Locomotives

Mining Locomotives

Switches, Controllers and all

Auxiliary Equipment

Automatic Regulators

Steam Turbo Generators for
normal or high pressures
and superheats

Oil Switches

Condensers and Auxiliaries

Relays

Turbo Compressors and Blowers

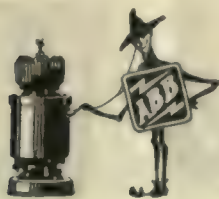
Electric Furnaces
Induction Regulators
Ships

Diesel Driven

Turbine Driven

Electrical Driven

Structural Steel Fabrication



Mercury-Arc Power Rectifiers

benefit in public-relations problems!

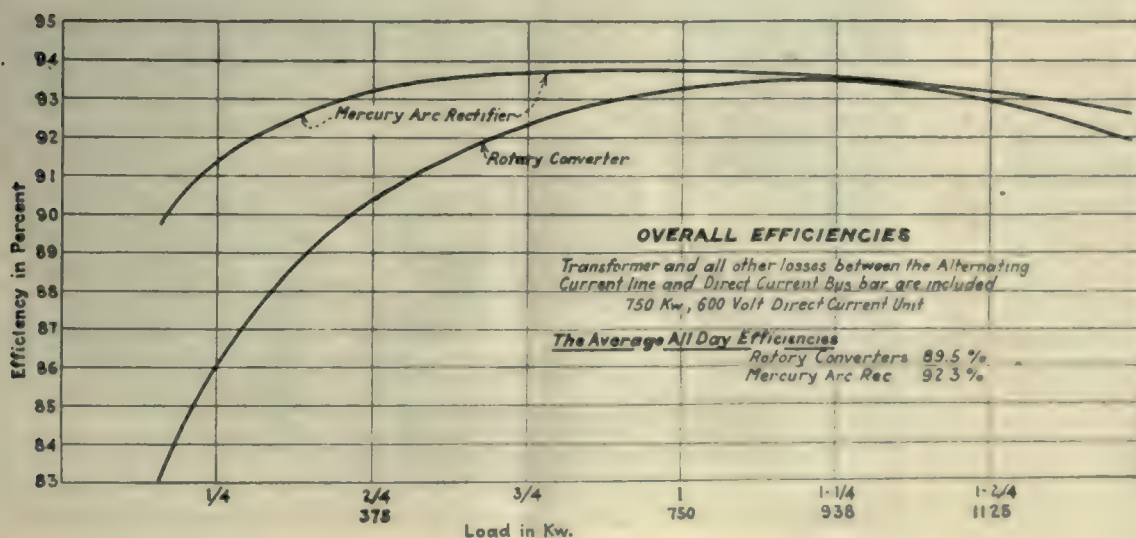
Of special value to railway companies is the fact that mercury-arc power rectifiers are noiseless and vibrationless in their operation. This feature permits the erection of rectifier sub-stations in any locality where they are most required, regardless of how densely populated the particular locality selected may be. With rectifiers, a sub-station may now be so constructed that it will be accepted as a desirable neighbor in residential sections.

American Brown Boveri Electric Corporation

165 Broadway, New York, N. Y.

Camden, New Jersey

922 Witherspoon Bldg., Philadelphia. 842 Summer St., Boston. 230 South Clark Street, Chicago.



AMERICAN BROWN BOVERI

The New White



The new White Six Bus (Model 54) fills a definite need in the allied transportation systems of electric railways and other transportation fields.

Meeting today's need and ready for tomorrow's, the new White Six Bus answers the public's demand for greater ease, safety and speed in city and inter-city transportation.



Four-cylinder White Busses—Model 50-B, 25 to 29 passengers, and Model 53, 14 to 21 passengers—will keep on being money makers for their owners. The White Company will continue to manufacture four-cylinder busses because they fill a definite need and meet the varied demands of bus operation.



WHITE

FOURS

Six Bus —

Advanced Engineering Features

- 1. 100-H. P. Engine**—in the chassis, on the road; 6 Cylinders.
- 2. Seven-Bearing Crankshaft**—3" in diameter; main bearings mounted in deep, rigid crankcase.
- 3. Overhead Valves** — All parts automatically and fully lubricated, fully enclosed.
- 4. Four-Wheel Brakes** —Air compressor part of the motor; lubricated by the engine lubricating system.
- 5. Nine-Inch Balloon Tires**— Balloon tires and easy steering; semi-center point steering; straight drag link; straight tie rod.
- 6. Double Drop Frame** —Security and comfort, carrying the load close to the road; easy entrance and exit.
- 7. Two Stage Springs**— Hotchkiss drive; springs 5' 4" long.
- 8. Superior Performance, Economy and Comfort**—A new sensation in bus performance.

THE WHITE COMPANY, CLEVELAND

BUSSES

AND SIXES

Write for complete specifications and delivery dates on the new White Six, Model 34 Bus.



The reduced expenses, and often increased revenue, mean such a large annual return on the investment that modern cars soon pay for themselves—and then they go on earning more than the obsolete cars they replaced.



New light-weight cars help retain railway service for "the Attleboros"

The history of the Interstate Street Railway covering recent months is another story of the power of modernization to make railway operation pay.

This road operated at a loss, passed into receivership and was sold at auction. Then it purchased lighter, attractive cars, G-E equipped; began one-man operation; increased schedule speeds; reduced sub-station costs by the adoption of automatic control; and promoted public good will.

Savings made during three months' operation total more than \$13,000—an annual return of 65% on the new-car investment.



General Electric equipment has been chosen for many of the recent outstanding, forward-looking car developments. It has helped to make many of the operating records which have established so conclusively the value of the modern light-weight car.

	Operating costs per car-mile for 3-month period during 1925		Reductions in operating costs per car-mile for accounts affected by the NEW CARS	
	Old Cars	New Cars	Cents	Per cent
Way & Structures	4.10¢	2.38¢	—	—
Equipment	8.11	3.14	4.97¢	61%
Power	8.50	5.43	3.37	38
Conduct. Trans.	13.06	9.02	4.04	31
General & Misc.	3.52	5.93	—	—
Total	37.59¢	25.90¢	12.38¢	33%

GENERAL ELECTRIC

Electric Railway Journal

Consolidation of Street Railway Journal and Electric Railway Review

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CHARLES GORDON, Editor

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Number 21

Cause of Death— Malnutrition

PROPER maintenance of equipment is one of the best selling forces an electric railway may employ. In the past ten years the transportation industry has witnessed the abandonment of many properties. Of these it is probable that a large number would still be in operation if proper attention had been given to their physical upkeep.

Take as evidence one representative property in New England. This small company last spring discontinued its operations when scarcely a vestige of public patronage remained. Evidence of erratic maintenance was on every hand, and it seemed that this one item alone was sufficient to explain the steady decline in the company's fortunes.

The initial negligence lay in the condition of the track. More than one-fifth of the total mileage was laid in permanent pavement with 9-in. girder rail and steel ties set in concrete. The remaining roadbed was exposed 70-lb. rail on private right-of-way. The girder rail was eight years old, the tee rail was twenty. No money had been expended in maintaining the pavement and rail. Joints that could have been kept smooth were pounded down and the pavement had broken away beneath, allowing water to do its usual damage. Several hotel proprietors complained because guests were wakened early by the pounding of car wheels over these neglected joints. Finally the local hotel association appealed to the state utility board and the cost of relaying with new girder rail was the strongest point in the argument presented by the company attorneys when abandonment was sought.

Grading on the private right-of-way was apparently a lost art. Alignment of particularly bad sections of track and the occasional replacement of a rotting tie had been the extent of the company's efforts in this direction. The track paralleled a state highway for 18 miles and the sunken rails, in some places more than a foot below the grade of the boulevard, made winter service anything but reliable—an urgent invitation to competition by bus and private automobile.

The overhead line contributed to the ensemble of despair. Every windstorm, every cold snap, every extremely hot day evidenced the weakness of the structure. Interrupted service due to line failures made a dissatisfied public and invited the attention of every jokesmith in the various communities served.

No exception to the rule was found in the shops. There was no provision for armature baking, no field testing equipment was in sight, nothing modern—only tools and machines dating back to the '90s were in evidence. The cars were old-fashioned, heavy units, the motors obsolete, the controllers and other mechan-

ical equipment poorly kept up and the condition of the woodwork was ample evidence that paint or varnish had been unknown for many years.

Struggling along with inadequate forces and with little or no money, the local management had been unable to make both ends meet—its hands had literally been tied, so far as any effort toward modernization was concerned. This case is but another proof that the longer one remains in a bed of quicksand the deeper and faster one would sink. Were this little property to have been saved, strenuous efforts should have been instituted many years ago. It is harder to win back patronage than to hold it.

Attractive Working Conditions Result in Better Maintenance

INCREASED attention is being given to providing greater convenience and comfort for shop forces of electric railways. Many shops now have sections set aside as lunch rooms and recreation quarters. Individual steel lockers, drinking fountains, and in some cases shower baths have been installed. In new shop construction better heating and lighting, provisions for effective cleaning and many added comforts are being incorporated. All these raise the standard of the workmen, prevent waste of good material and accumulation of refuse, save time in making repairs by enabling workmen to see clearly the equipment they are working on and to feel comfortable while they perform their duties.

Poor working conditions are responsible for much bad maintenance. In a recent visit to a railway property it was noticed that the cars were poorly maintained. On reaching the shop, this was found to be little more than a roof with some holes in the ground for pits. The pit walls were of rotted boards and the bottoms were dirt with only loose boards laid over them. In rainy weather the pits were wet and muddy; in cold weather the temperature of the shops was almost the same as that out of doors. An atmosphere of darkness and dampness pervaded the place. It was little wonder that the work was poorly done.

Electric railway shop men are human. Where physical discomfort is a daily experience a poor grade of work is sure to result. While sometimes mechanical repairs can be carried on successfully out of doors, it is much cheaper if this work can be done inside and better results will always be obtained. Time lost when men have to leave their work for short periods due to their physical discomfort amounts to a considerable total during a year. The time thus lost is added to by slowing down of work caused by poor lighting, use of old and inefficient machine tools, slow methods of

This is the issue in November that is devoted essentially to maintenance and construction subjects

handling parts, and waiting for cars to be placed in position due to a poorly-planned track layout.

The grade of men which a railway is able to secure for work in its shops is also influenced largely by working conditions.

Any plan that will provide better working conditions in electric railway shops is to be commended. It will certainly result in better-maintained equipment, which is now so essential in order to increase car riding. High-grade mechanics will not stay in a place where the surroundings are unsatisfactory.

Importance of Maintenance Is Not Measured by Interference to Service

DURING the past few years the spirit in which the average electric railway management approaches the public has undergone a noteworthy change. Many irritating practices once thought to be inevitable concomitants of operation have been eliminated. Good will has rightly been judged more valuable than certain of the economies practiced in the name of efficiency.

An earnest attempt has been made in most cases to inculcate in all employees this spirit of thoughtfulness of the public. Generally speaking, the men of the transportation departments have grasped the idea well. Maintenance men, on the other hand, sometimes appear to overlook the need for close attention on their part to avoid anything that annoys passengers unnecessarily.

Seldom does the maintenance man come in direct contact with this public. Hence his importance is not generally realized within the industry itself. When he does meet the public directly, during repairs to track under traffic, or when fixing minor defects of a car on the road, he has a natural desire to show how important he really is. The track man may do this by holding one or more passenger cars while a material car is unloaded, or while a piece of rail is cut out with an acetylene torch. The mechanical man may do it by fussing overmuch with lights, buzzers, or a fare register while a carload of passengers is kept waiting.

Probably the maintenance men who sometimes allow their work to interfere with passenger traffic honestly believe that they are doing it for the good of the service—saving the company money, or assuring the adequacy of repairs. By explaining to these men the importance of giving constant attention to the convenience and comfort of the passenger, the management can give them the merchandising viewpoint which lately has made many friends for the electric railways.

Waste Elimination Work Still Presents Great Possibilities

PROBABLY the most outstanding industrial accomplishment since the war has been the reorganization of the American railways, according to Secretary Herbert Hoover of the Department of Commerce in his annual report. While this compliment is directed mainly to the steam railroads, the electric lines have likewise contributed their share to the general improvement. Not only have they bettered their service in the great majority of cases, but the great savings in operating costs have made possible rates that are much lower than would otherwise have been necessary.

Prominent among the savings enumerated by Mr. Hoover is the elimination of waste. He places this in the lead as the essential problem for solution if the

standards of American living are to advance. "One of the major attacks upon industrial and commercial waste lies in standardization and simplification," he said. "By standardization we secure a positive approach through the establishment of definite notation in dimensions, quality and performance of materials and machines which must be accompanied by a development of tests to be applied in the determination of the fulfillment of these standards. By simplification we secure a negative approach through elimination of the necessary varieties, dimensions or grades of material and products."

In both standardization and simplification the electric railway industry has taken a prominent part. It is necessary, however, that the work be continued, since elimination of one form of waste frequently leads to the uncovering of another that had been effectively masked. Mr. Hoover's proposal is no visionary or bureaucratic appeal, but one that is intensely practical and already has brought most valuable results. In furthering the work every railway can do its share. The success of the campaign will redound to the credit of all who get behind it.

Many Factors Affect Convention Location

LOCATION of the annual convention of the American Electric Railway Association for 1927 is being considered earlier than usual this year, in order that the time and place may be settled so as to permit the industry to proceed with plans to exceed again the records for attendance and exhibits established this last year at Cleveland and to outdo the enthusiasm shown there.

There is no question but that the location of a convention has considerable to do with its success. Closely associated with this factor is the co-operation offered by the local people who are interested in getting a convention in any given city. Natural attractions, hotel facilities, exhibit facilities and accessibility are all important factors in locating a convention. Cost to members, to the exhibitors and to the association are also important elements to be considered.

Last year, the matter of providing proper facilities for staging a representative electric railway car exhibit received careful consideration in selecting the place for the convention. The effect of such an exhibit on the industry itself and on the general public was considered to be of paramount importance. The result at Cleveland testified eloquently to the wisdom of that selection. The co-operation given to the association by the late Mr. Stanley, by J. H. Alexander and by the entire Cleveland Railway organization exceeded the limits of reasonable expectancy. The expense incurred by the local company in making the Cleveland convention the outstanding success that it was reflected the sincerity with which the Cleveland people carried out the promises made to last year's committee. This co-operation, combined with the ideal facilities provided for car exhibits, resulted in bringing about the largest exhibit of electric railway cars ever held in the history of the industry.

Hotel accommodations at Cleveland were far behind those available at Atlantic City. Although Cleveland has the advantage of a more central location, its natural attractions do not equal those of the seaside resort. Weather conditions were also unfortunate, particularly during the early part of the week.

Both Atlantic City and Cleveland are again actively seeking the next convention. The former seems to have the advantage from the standpoint of attractiveness and housing, the latter from that of exhibit facilities and central location. Although there will be available by next fall at least three new centrally located hotel buildings in Cleveland, Atlantic City would probably continue to have a decided advantage on this score.

All of these factors must be weighed carefully by the committee on location of the convention, and by the executive committee. The effect made on the industry and the public by a properly staged exhibit of progress in electric railway cars must receive primary consideration by these committees in the interest of maintaining and accelerating the definite forward movement which has set in during the past year. Many of the factors which must be carefully weighed by a location committee may not be apparent to one who gives the place of the convention only casual consideration, or who forms an opinion based on personal preference. This year's committee is starting its work early in the interest of the industry. The committee is a large one, and represents fairly the views of both operators and manufacturers from various sections of the country. The industry may await its decision with the assurance that the many diverse factors involved have received careful consideration, and that its selection will be dictated by the primary motive of promoting the interest of the entire industry.

Utility Commissioners Take Constructive View of Railway Situation

STATEMENTS made in the report of the committee on service of public utilities before the annual meeting of the National Association of Railroad and Utilities Commissioners in Asheville, N. C., Nov. 9-12, published elsewhere in this issue, warrant the careful consideration of every electric railway executive.

"The biggest service problem before the industry at the present time," says the report, "is that of modernizing its equipment. Cars which are more comfortable, more speedy and less noisy than ever before are being built, and with light weight and one-man operation they are frequently more economical to operate than the older types. The commissions can and should co-operate with the street car companies in this movement, because it is generally agreed that *today good service is more important in street car regulation than cheap fares.*"

The movement for the improvement of electric railway cars and the elimination of obsolete equipment, which is costly to operate, which drives away riders and which gives the industry the appearance of being down at the heels, is just getting under way. It has barely started. But the possibilities of this new thinking are clearly and emphatically brought out by this statement on the part of those charged with the regulation of railway fares.

Some railway executives have questioned the advisability of fare increases. In many instances an increase in fare has brought little if any increase in revenue. The drop in riding that followed higher fares on some properties raised a grave question as to the advisability of such increases. For a time it seemed that the only solution was to hold down fares and then to squeeze a narrow operating margin out of the situation by affecting still further reductions in operating costs.

Now all this appears to be another illustration of the lack of merchandising acumen in the electric railway industry. Had we been better merchants we would have realized that an increase in price is bound to cut down the volume of business unless there is at the same time a decided improvement in the character and attractiveness of the product.

It has been repeatedly pointed out in the JOURNAL and has been demonstrated by actual experience on those properties which have given the subject serious attention that improved cars have not only a direct effect on volume of riding and on operating costs but that they also help to create that favorable public opinion regarding railways which is absolutely essential to success. Public officials are helpless in the face of an unfavorable public opinion, regardless of how thorough an understanding they may have of the railway situation or how much they may be in sympathy with its difficulties.

Those railway men who still question the advisability of adopting heroic measures, if necessary, to substitute modern cars for obsolete equipment, and who still cling with an inexplicable attachment to heavy, cumbersome cars—even to the extent of spending several thousands of dollars apiece on them for remodeling—will do well to consider carefully the significance of this report by the utility commissioners. When representatives of the public are ready to say frankly that good service is more important than cheap fares, one is led to wonder whether they have not progressed further in their thinking on electric railways than have some of those who have the direct responsibility for making a favorable financial showing.

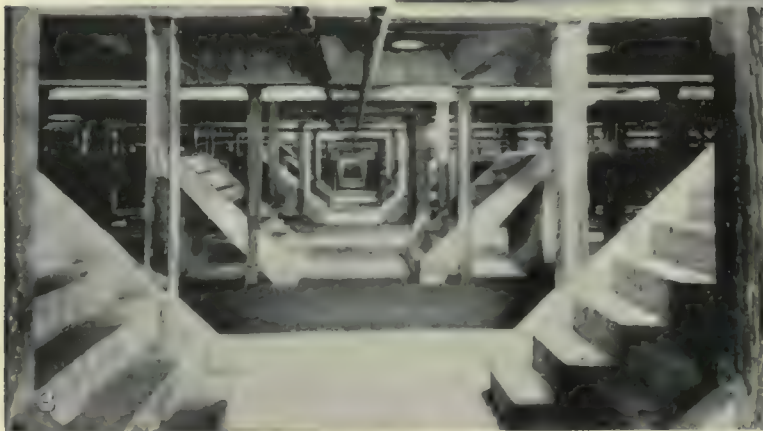
Coffin Award Contest Will Bring Out Best of Railway Accomplishments

DURING its recent meeting at association headquarters the Coffin Award Committee decided to issue at an early date invitations and announcements of the conditions of the 1927 award. Experience with the contest during past years has more than demonstrated its value to the industry, and particularly to the various participants, regardless of whether or not they win the award. For that reason the action of the committee in making possible early preparation of briefs is a wise one.

Each year the committee has experienced increasing difficulty in making a decision. This is largely attributable to the varying size and character of the briefs presented by the participants. In its report last year the committee made it clear that the award was made on the basis of the value of the accomplishments to the industry as a whole. This is unquestionably a constructive viewpoint. But the committee has repeatedly pointed out the difficulty of making a single selection under present conditions. The purpose of the award would probably be even better carried out than at present by its extension to permit fuller recognition of outstanding accomplishments by more than one company. Regardless of the extent to which this objective may be carried out during the current year, however, the conditions of participation are such that the benefit derived by a given company, even though the award is not won, is more than enough to justify the preparation of briefs by every railway which has made substantial progress during the year.



**Convenience and
Comfort
for Shop Forces
Are
Outstanding Features
of Fort Wayne Shops**



No. 1. The foremen's offices command an unobstructed view of the overhauling section.
No. 2. Wheel storage is in the basement under the machine shop.

No. 3. A spacious intercommunicating passage is provided between pits. This runs entirely across the central portion of the shop.

No. 4. The track pits are elevated platforms when viewed from the basement floor.
No. 5. Wash fountains and lockers are provided for the shop forces.

Attractive Overhauling Shop Completed in Fort Wayne

Large Building of Red Brick Added to Group Comprising Spy Run Shops of Indiana Service Corporation—Novel Pit Construction Used—Overhead Crane and I-Beam Traveling Hoist System Provide for Efficient Handling of Equipment — Machine Tools Provided with Individual Motor Drive



By Use of Three Roof Levels, Abundant Light Is Provided in the New Shops of the Indiana Service Corporation

LABOR-SAVING conveniences for handling car equipment during overhaul and an arrangement of departments that will fit into a carefully laid-out system for routing work are features of the new general overhauling shop of the Indiana Service Corporation at Fort Wayne, Ind. This is the eighth building of a group that constitutes the Spy Run Shops. Others include an inspection carhouse, building for general overhauling of buses, another for bus washing and storage, a fare box house, store house and oil house. The various buildings are surrounded and separated by attractive grounds so that the visitor is at once impressed with the orderly appearance that prevails in all departments. Well-kept lawns, crushed-stone walks, track with crushed-stone ballast and attractive buildings of red brick, all contribute to the pleasing appearance that is produced. The entire group of buildings and yard is surrounded by a Cyclone wire fence 6 ft. high.

High-grade fireproof construction of the steel skeleton type has been used for the new overhauling shop. The exterior walls are of high quality red brick laid up in red mortar with raked joints. Limestone trim, together with attractive pilasters, forms the ornamentation. The stone trim includes a water table, sills, coping, nameplate and pilaster. All windows have factory-type ventilated sash and the doors are all tubular steel hung on channel iron frames. The doors and the window frames are painted dark green of such a shade as to harmonize well with the brick work and the limestone trim. Large swinging doors are provided at track openings. These are of the double section swinging jackknife type and swing outwardly, thus conserving space inside. They are hand operated and glazed to within 4 ft. of the bottom with semi-obscure glass.

All foundations for both the outside and interior walls to the ground floor level are of plain concrete. Floors

Machine Tool Equipment in Overhauling Shop of Indiana Service Corporation

MACHINE SHOP

24-in. planer.
2-in. Acme bolt machine.
2½-in. Morris radial drill.
20-in. Barnes drill.
6-in. Peerless hacksaw.
12-in. x 2-in. Ransom emery grinder.
Automatic electric babbiting pot.
22-in. shaper.
No. 2 Kearney & Trecker milling machine.

WHEEL SHOP

48-in. Niles car wheel lathe.
400-ton Niles hydraulic wheel press.
42-in. Niles boring and turning mill.
42-in. engine lathe.
12-in. x 2-in. Ransom emery grinder.

BLACKSMITH SHOP

Two down-draft forges.
No. 2 Long & Allstatter punch and shear.
Air-operated bulldozer.
500-lb. trip hammer.

ELECTRICAL REPAIR SHOP

20-in. engine lathe.
Westinghouse electric soldering furnace.
Baking oven.
Armature racks.

Banding lathe.
Soldering furnace.
Dipping tank.

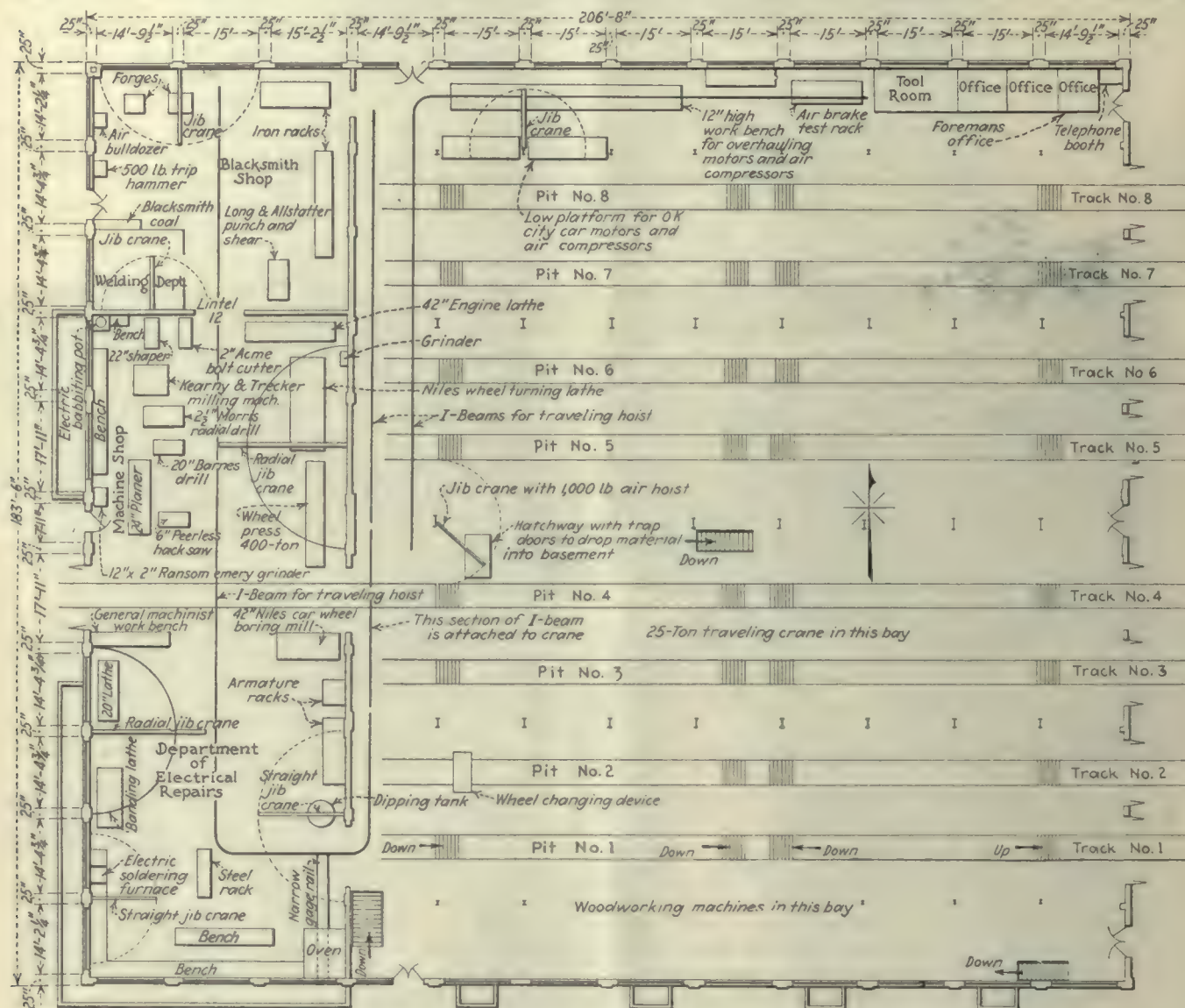
WOOD MILL

24-in. surfacer.
Double-spindle shaper.
36-in. bandsaw.
Hollow chisel mortiser.
Wallace circular bench saw.

12-in. jointer.
Turning lathes.

of the machine shop and the two outside bays running the length of the shop are of creosoted wood block flooring. The floor of the blacksmith shop is of crushed cinders with a topping of screened crushed limestone. All other floors are constructed of reinforced concrete with

tion is 4 ft. 6 in. below the bottom of the pit. The pit floors thus appear like elevated platforms in the basement. They are of reinforced concrete and are supported at 8 ft. 6 in. intervals by upright 6-in. H sections which extend from the basement floor to the shop floor.



Floor Plan of the New Overhauling Shop of the Indiana Service Corporation

a one-to-one monolithic mortar top treated with metallic hardener.

The roof construction is of a precast concrete flat tile supported by steel purlins. It is treated with a five-ply pitch felt and gravel waterproofing. All flashing is 16-oz. copper. The front portion of the shop is designed with six bays, so that there are three roof levels. The two central bays are highest. The roof for the next bay on either side of the center drops down about 6 ft. and the roofs for the two outside bays drop down a further distance of 6 ft. This construction was adopted particularly in order to give effective illumination inside the shop without the necessity of employing saw-toothed roof construction.

The building is 185 ft. wide and 207 ft. long. The four central bays have two tracks each spaced on 15-ft. centers. This makes a total of eight tracks entering the building. All have pits. The pit construction for the four tracks in the south half of the shop is of unusual type, in that the basement floor under this sec-

The pits are thus entirely open both above and below their floor levels. They are 4 ft. 6 in. deep. Stairways are provided at each end of the pits and also in the center. These latter stairways lead down to the lower level so as to serve the dual purpose of reaching the basement and for intercommunication between pits. The construction of the four pits in the north half of the shop is quite similar except that there is no basement extending underneath the pit flooring. At present the lower level is used for storing materials, but as it is provided with ceiling lights and also with daylight from the open pit construction and light wells along the exterior walls, it is contemplated using certain portions for bench repair work.

Illumination of the pits themselves comes from the ceiling lights of the basement. The basement is illuminated by 23-watt lamps and 300-watt lamps are used for artificial light throughout the main shop, machine shop, armature room, etc.

This unusual type of construction was adopted partly

because there already was an excavation at this site before the building was constructed. At one time this was the forebay of an old-time water plant. With the use of modern improvements in power, the water-power plant was discontinued and a dried-up pit remained where the forebay stood. As the filling in of this pit would be rather expensive, it was decided to make use of it as a basement and to elevate the floors of the car pits. This type of construction is proving of particular

cars. The two bays with pit tracks Nos. 5, 6, 7 and 8 are used for heavy inspection and for light repairs. At the present time the bay along the south wall is equipped with woodworking machines and serves as a carpenter mill. It is planned, however, to construct an additional building to the north of the present overhauling shop some time in the future. This new building will be used as a carpenter and paint shop. The basement directly underneath the woodworking department is used for



The Machine Shop Has Many Jib Cranes and an Overhead I-Beam Hoist System for Handling Material

advantage in connection with lighting, heating, and ventilation, and the additional expense that was necessary for steel reinforcement and concrete was very slight.

MACHINE TOOL SECTIONS LOCATED AT REAR

A space 53 ft. 4 in. wide at the rear of the shop is divided from the front portion by a brick wall. This section is used for the department of electrical repairs, the machine shop, the wheel shop, blacksmith and welding shop. In the front portion the two outside bays provide space for miscellaneous bench repair work. The bay having pit tracks Nos. 1 and 2 is used for repairs to city cars. Track No. 2 is equipped with a wheel-changing device for changing wheels in single-truck cars. The equipment was furnished by the Columbia Machine Works and is driven by a 5-hp. motor. The bay with pit tracks Nos. 3 and 4 is used for heavy interurban repairs and for truck repairs to both city and interurban

lumber storage. The present woodworking machines installed in the south bay are listed in an accompanying table.

The bay along the north side of the shop is used for motor overhauling, for testing of air-brake parts and equipment, and also includes a tool room and offices for the shop foremen. There are three partitioned rooms arranged so that two are occupied by the foremen, with the additional office for clerical help and records. The tool room is inclosed so that it can be locked. These offices command a view of the entire front portion of the shop. The offices of the superintendent of motive power, Arthur Reddersen, are located on the second floor of the adjacent storeroom building. This leaves the superintendent free from shop interference so that he can give his whole attention to administrative duties.

The materials handling equipment includes an overhead traveling crane, overhead I-beam traveling hoists,

radial cranes, and jib cranes. The bay of the shop that contains pits Nos. 3 and 4 has a 25-ton traveling crane operated from the floor. The bay that contains pits Nos. 5 and 6 is of the same construction and can be equipped with an overhead crane whenever car repair work makes this necessary.

There are two overhead I-beam traveling hoist systems. One has an I-beam at the rear of the overhauling section, starting from pit track No. 4 and continuing along the rear to the bay at the north side of the shop and then through the length of this bay. The other I-beam traveling hoist starts from the north wall at the rear of the overhauling section, runs across the shop and through the opening into the department of electrical repairs. The I-beam then turns so as to run through the central portion of the department of electrical repairs, the car wheel turning and boring section,

in addition to these three radial jib cranes the department of electrical repairs has a straight jib crane and there are two additional straight jib cranes in the blacksmith shop, one of these being located so as to serve the welding room. An accompanying table gives the various machine tools provided for the different departments.

OVERHAULING WORK WELL SYSTEMATIZED

When motors or trucks are to be overhauled, the car is brought into the shop on track No. 4, which runs entirely through. The overhead traveling crane lifts the car body while the trucks are run out from underneath. The body is then set on horses during the overhauling. Truck overhauling work is done at the end of tracks 3 and 4. Where motors are to be overhauled they are lifted out of the trucks by the crane and are then picked up by the I-beam traveling trolley and



The Blacksmith Shop Is Well Equipped with Tools to Handle the Forging Work for the Railway

the machine shop and the blacksmith shop. The overhead traveling crane is also equipped with an I-beam so that it can be lined up with the various overhead traveling systems. This enables the I-beam which runs across the rear of the overhauling section to be placed out a considerable distance from the wall, otherwise the travel of the overhead crane would be limited so that it could not go entirely to the rear wall.

A jib crane with a 1,000-lb. air hoist is mounted on one of the upright I-beams in the central section of the shop at the rear. This swings over a hatchway and is used for raising and dropping material into the basement. The motor overhauling section in the north bay is also equipped with a jib crane for handling motors. In the department of electrical repairs and to serve the wheel turning and boring sections there are two radial jib cranes and the machine shop is also provided with several jib cranes. The construction of the radial cranes provides a circular I-beam with a carriage to support the end of the boom so that these can be of sufficient length to reach to the center of the shop and thus serve a greater area than would otherwise be possible. In

taken to the motor overhauling station in the first bay along the north wall. Work of overhauling small motors and compressors is done on a bench with the top portion 12 in. above the floor. Handling of heavy parts is taken care of by the jib crane which serves this section, and after the motors are overhauled they are deposited by this crane on other low platforms which are used for O. K. motors.

Where armatures require repairing or rewinding they are taken by the overhead traveling hoist to the department of electrical repairs. Here they are placed on armature stands, where dismantling and rewinding are done. Two lathes in this department are used for turning commutators, slotting, truing up armature shafts, and other work on electrical equipment. A banding lathe takes care of armature banding work.

OVEN PROVIDED WITH BOTH STEAM AND ELECTRIC HEAT

All armatures and field coils are dipped and baked. This work is done in the corner nearest the overhauling shop. A jib crane serves the dipping tank, oven and armature racks which are installed along the wall. The

baking oven is located in the southeast corner of the electrical department. Both steam and electric heating are used in the oven. Steam is used to bring the temperature up to the proper baking point, after which the temperature is held there automatically by the electric heaters under thermostatic control. As live steam is available from the adjacent power house a considerable saving in electrical energy is obtained by this method. The oven is also equipped with a Bristol recording thermometer and a Westinghouse insulation tester. This latter equipment is essentially a voltmeter in series with the armatures being baked. One side of the voltmeter is connected to the trolley circuit and the other terminal with the commutator of the armature, while the shaft is grounded to the truck on which it rests. When the voltage reading drops to 10 the armature has been baked sufficiently. Provision is made so that the

the outside directly into this section. New wheels are lifted through the hatchway in the overhauling shop by the jib crane and are rolled to the boring mill and wheel press. Wheels removed from cars are rolled to the wheel press, or to the wheel turning lathe, and after the work is completed they are returned to the trucks or else are lowered through the hatchway. Any surplus wheels and axles are returned to the basement storage. If required for immediate use they are returned to tracks 3 and 4 for mounting in trucks. The radial jib crane of the machine shop serves the wheel lathe and press and also the engine lathe in the corner which is used for axle work. The car wheel boring mill has its own hoist as a permanent fixture of the machine.

Machine tools in the machine shop are grouped along the opposite wall from the wheel section. The arrangement of machinery is shown in the accompanying floor



The Central Bay, Used for Overhauling Heavy Equipment, Is Provided with a 25-Ton Travelling Crane

tester may be connected to six different armatures and separate tests can be made by merely operating a switch without opening the door of the oven.

At the present time the armature dipping tank is placed near the oven and is stationary, but it is planned to mount it on a truck so as to make it portable. A narrow-gage track runs from the doorway into the oven, and a truck with a capacity for eight of the largest types of armatures on end is used for rolling into the oven.

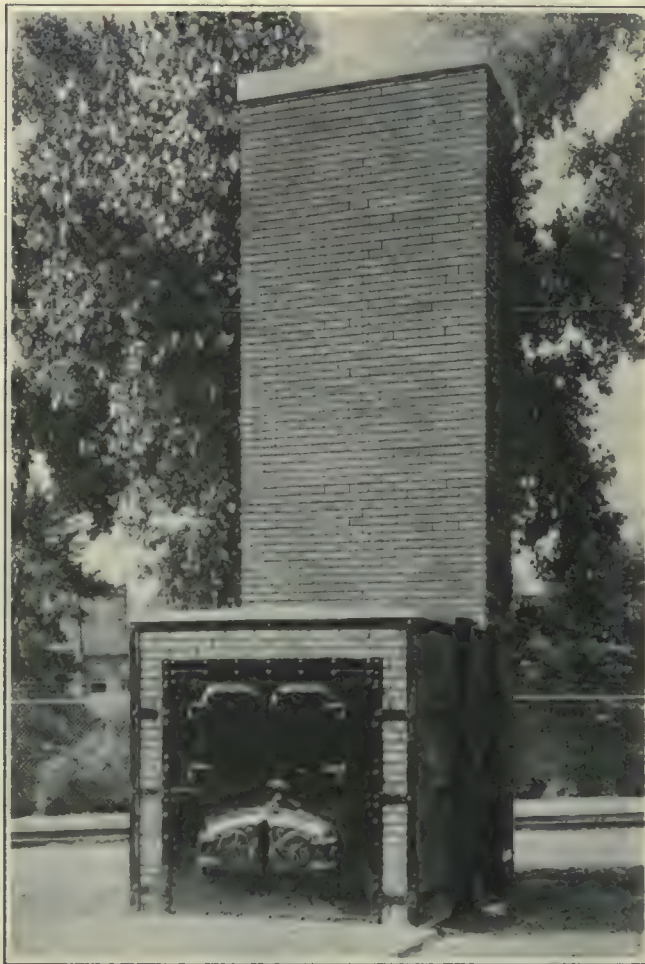
This electrical repair department also takes care of maintenance work on controllers, resistors, circuit breakers, unit switch groups, relays, brush holders, etc., and for doing this the shop is well equipped with modern work benches, which are mounted on steel legs and equipped with steel drawers. Steel skeleton shelves are also distributed throughout the department for racking various materials.

All wheel work is done by machines which are grouped about the through track No. 4. The machine tool equipment includes a wheel lathe, press, boring mill and axle lathe. Car wheel storage is underneath this section in the basement and wheels are rolled through a door from

plan and the table gives a detailed list of the machine tool equipment. Work necessary for babbitting bearings is done in one corner of the machine shop and an electric babbitt pot is provided for this work.

The blacksmith shop is well equipped with tools to handle the necessary forging work of the electric railway system. One corner of the blacksmith department is partitioned off as a welding room. This is equipped with a Westinghouse motor-generator set for electric welding. Acetylene gas is also used for some welding operations, but is used principally for cutting purposes. About 90 per cent of the welding is done electrically. The electric welding machine is portable and also is provided with long leads so that welding work can be done in the overhauling section of the shop if necessary. Heavy work is handled by the I-beam hoist and jib crane. All windows along the west side of the shop are equipped with Venetian type window shades with blinds.

There is a large open space back of the overhauling shop which can be used for outside storage, but as the basement portion is quite large, it is considered that this will be ample to take care of the needs for some time. Access to the basement is by a rear door which



The Incinerator Assists Materially in Keeping All Departments Free from Refuse. It Is 7 Ft. 2 In. x 10 Ft. 6 In. x 7 Ft. High and Has a 22-Ft. Stack

opens directly into an areaway and, in addition, as already described, material is also handled through the hatchway in the shop by means of the jib crane. In the space back of the shop is an incinerator plant where all refuse material is burned and where insulation is removed from copper parts for sale as scrap, as are also salvaged iron parts. One corner of the basement is fitted as a wash room with shower baths, locker room, lunch and rest room for shop forces. All plumbing fixtures are porcelain, except the wash fountains, which

are pearl marmorite. These wash fountains are of circular concrete type and are provided with foot rings for control of the water so that it is turned on only while being used for washing purposes.

The building is heated by direct radiation. The machine and blacksmith shops have unit heaters in addition with a low pressure vacuum system. Steam suitably reduced for heating is furnished from a power house near by. All electric lighting fixtures, placed in a manner to produce the best lighting effects, are in accordance with the latest practices and codes. A complete fireproof transformer distribution vault in the basement provides all power and lighting requirements.

The shop air system is supplied by a National Brake & Electric Company's 225-ft. compressor located in the basement underneath the machine shop. The shop air pressure is 110 lb. From the compressor a main line runs to the central part of the shop and then a cross line runs through the high part of the basement to the walls. This line has taps at each pit and provision is made for three outlets along the sides of the pits. The air line runs along the north wall of the shop to the air-brake test rack, and piping is arranged from the test rack so that various parts of air-brake equipment can be tested not only on the rack, but also on the cars themselves. This piping runs from the test rack across the passageway to the various pits. Outlets are provided so that air hose can be attached to reach to any piece of apparatus on the car itself and such parts as governors, feed valves, triple valves, etc., are thus tested in place. The test rack is also provided with storage reservoirs and compressors are given a running test against pressure after they are overhauled.

Signal Bells Ring Again in Los Angeles

SIGNAL bells are to be put back on the cars of the Los Angeles Railway, Los Angeles, Cal. The work of replacing them on cars, which are now equipped with metal-strip signals, will be done as rapidly as possible. The bells were removed many years ago because they were found to be a source of irritation to the motormen. A thin strip of metal was used to replace the bell. However, with the progress of time, the traffic noises increased so greatly that it is now difficult for a great many of the motormen to determine whether the conductor has given the signal to proceed.



The Network of Tracks with Crushed Stone Ballast Sets Off the Overhauling Shop in the Rear



The New Storehouse with Offices of Superintendent of Motive Power Are Adjacent to Overhauling Shop

Accurate Machining of the Vs of Assembled Commutators Is Essential*

By *Jesse M. Zimmerman*

Renewal Parts Engineering Westinghouse Electric & Manufacturing Company

By Machining the Vs of Assembled Commutator Segments to a Smaller Gage Diameter, High Bars Experienced with Arch-Bound Commutators Are Eliminated—Careful Gaging and Testing Insure Accurate Workmanship

IN THE early days commutators were of the arch-bound type. It was necessary to tighten the commutator and "re-turn" the surface at the slightest indication of high bars. High bars were due to the whole structure loosening during the so-called process of seasoning, when the excess bond in the mica strips and V rings squeezed out. This led to the development of three things: (1) A mica plate for mica strips with a properly seasoned bond; (2) V rings which have a minimum amount of bond, along with proper flexibility of the mica; and (3) the "V-bound" or "opened-up" commutator.

It will be well to explain the meaning of "gage diameter" of a commutator. It is the distance from the point where the extended sides of the 30-deg. and 3-deg. angles of the copper V or steel V intersect to the same point diametrically opposite. It can be measured accurately only with a male bridge gage.

After extensive tests, it was found that by machining the gage diameter of the Vs of assembled segments a definite predetermined amount, which is dependent upon the size of the commutator, different than the gage diameter of the steel V ring, it was possible to eliminate the difficulty encountered with high bars on the arch-bound commutators. When the commutator is assembled, the pressure of the mica V ring will be first exerted on the 3-deg. angle of the copper V. When the banding wire is cut the bars will all push outward, thus relieving the arch-bound pressure between the copper bars and mica strips sufficiently so that each bar will be held firm by the V ring. "Opened-up" places will appear after the banding wire is cut when the assembly is cold. This is how the name "opened-up" commutator was obtained.

After the assembled commutator has been heated and a pressure applied to the steel V ring, the pressure will



Final Test of Assembling Segments and Commutators. This Includes the 500-Volt Bar-to-Bar Test for Assembled Segments and Commutators and a 4,000-Volt Ground Test for Complete Commutator

also be applied to the 30-deg. angle of the copper V, drawing the bars in. When the assembly is cold, an equal pressure will be applied on the 30-deg. as well as the 3-deg. angle, thus holding each individual bar firmly so that it cannot raise or lower, should the bond squeeze out or the mica strips shrink.

BARS WITH Vs AND NECK PUNCHED TO AN UNFINISHED SIZE

Tapered bars for building commutators come either rectangular or with the Vs and neck punched to an unfinished size. The procedure for preparing these bars for machining is slightly different after alternate strips of mica and copper bars are built on a building plate, and will be dealt with separately as far as the work differs. The milled slots in the building plate permit the mica strips to extend beyond the copper bars, so as to produce the rear mica extension.

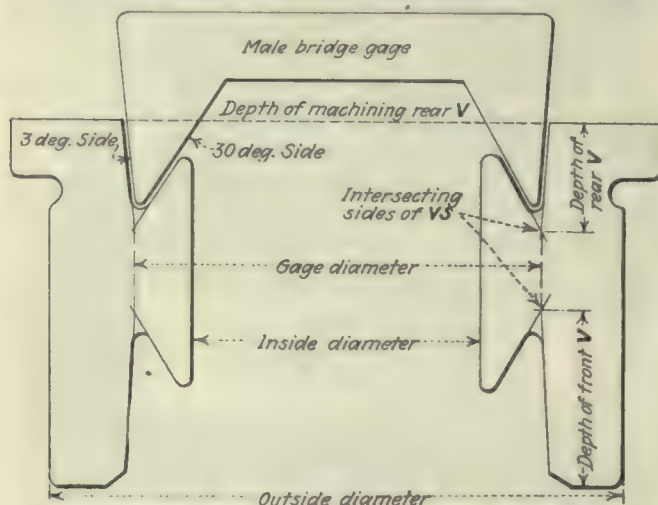
After the mica strips and copper bars are built on a building plate they are assembled on a dummy bushing. The assembled segments are then placed in an oven and heated to 150 deg. C. A split ring, which has a tapered face on the outside, is placed around the assembled seg-

*This is the third article in this series on commutators. Others were "Choosing Materials for Railway Motor Commutators," published Aug. 21, and "Important Considerations in Replacing Commutator Bars," published Oct. 23.

ments while they are hot. A strip of fishpaper is placed between the ring and the assembled segments. A solid ring, which has a reversed tapered face on the inside, is placed over the split ring and pressed on at a pressure of 20 to 30 tons. This produces an arch-bound assembly. The dummy bushing is removed and the commutator is allowed to cool before the Vs are machined.

After the rectangular copper bar and mica strips are built up, a three-piece clamp ring is placed around them and the bolts are drawn tight. A strip of fishpaper is placed between the ring and the assembled segments. It is important that the assembled segments form as true a circle as possible. After the clamping ring is tightened around the assembled segments, they are placed in an oven and heated to 150 deg. C. The bolts on the clamping ring are then pulled tight, forming an arch-bound assembly.

It is difficult, if not almost impossible, to measure the Vs accurately by a scale, calipers, etc. A special tool is made for this purpose, which is called the "male bridge gage." It is used to measure the diameter of the intersecting sides of the copper Vs and to check the accuracy of the angles of the Vs. It has two projec-



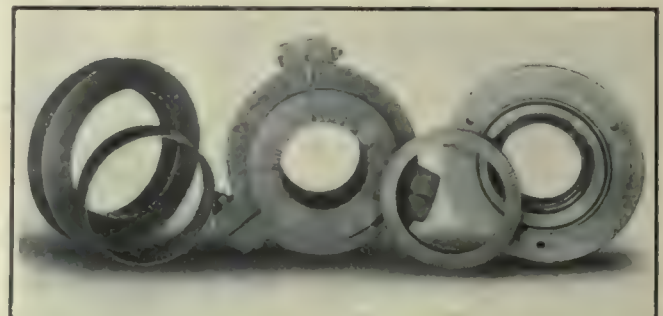
A Graphical Illustration of the Male Bridge Gage

tions which are the exact size of the Vs in the assembled segments. The extended sides of each of the 30-deg. and 3-deg. angles of the projections intersect at two imaginary points that are the same distance apart as the gage diameter to which the copper Vs are machined. Since the Vs of the assembled segments are machined to a gage diameter, which is different than the gage diameter of the machined steel Vs by a definite predetermined figure, the male bridge gage is made different by the same predetermined amount.

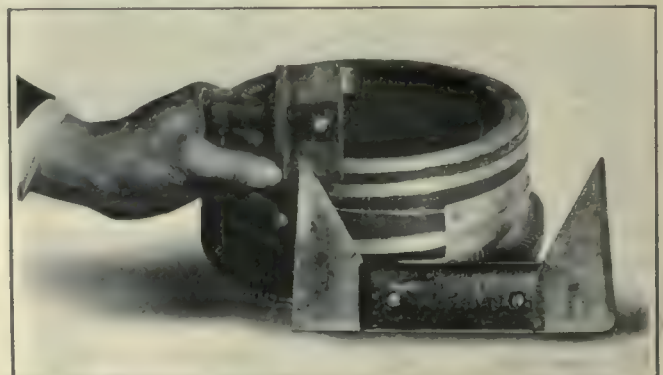
The depth to which the Vs are to be machined is marked on the projecting Vs by a special tool. This tool is made so that it will fit over the end of the projecting V. It has a clamp which holds the steel scale. The extended 30-deg. and 3-deg. sides of the V of this tool have an intersecting point, which corresponds to the intersecting point of the sides of the copper V. Assume that the V is to be machined 2 in. deep. Then the 2-in. point of the steel scale is matched with the intersecting point of the V on the tool. The tool fits over the projecting V of each end of the male bridge gage. The end of the steel scale is the depth to which the V is to be machined. This point is marked on the side of each projecting V of the male bridge gage. When



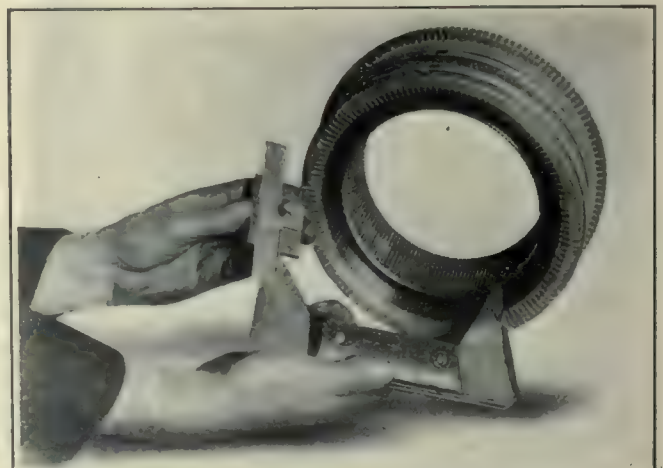
Cleaning Burrs from between Bars in the Machined V



Two Methods of Clamping Assembled Segments, the Solid Clamp Ring and the Three-Piece Clamp Ring. The Building Plate Shows Milled Slots Allowing Rear Mica Extension



Special Tool Used to Mark the Depth of the Vs on This Male Gage



Measuring Depth to Which Vs Are to Be Machined



Checking the Machined V in the Set of Assembled Segments During the Machining Operation. A Special Male Bridge Gage Is Used for This Purpose

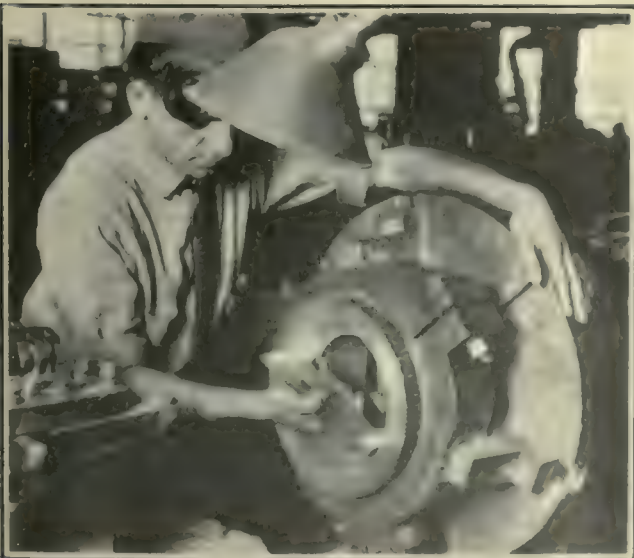
the two marks are in alignment with the end of the bar, it shows the correct machined depth of the Vs.

In the manufacture of a set of assembled segments, there are certain refinements that are essential if the life and service are expected to equal that of the original commutator. The lack of these refinements often causes premature commutator failures. Since every commutator failure invariably means damaged armature coils and various other motor troubles that will cause delays in service, one must take into consideration the cost of the delays caused by premature commutator failures when determining whether a set of assembled commutator segments without these scientific refinements should be used.

Some of the refinements necessary in the manufacture of assembled commutator segments are as follows:

A rear mica extension of $\frac{1}{8}$ in. should be allowed on all railway commutators. It serves as a barrier between the bars, thus eliminating the possibility of short circuits caused by solder while soldering the armature leads. It also increases the creepage distance between bars.

A mica extension of $\frac{1}{4}$ in. is desirable in the bore



Gaging Inside Commutator Segments During Machining Operation

of the assembled commutator segments. This mica extension, along with a drawn radius at the bottom chord of the bar, provides ample creepage distance between bars. Sometimes the distance between the commutator spider and the bore of the assembled segments is so small that it is necessary to machine the bore in order to provide sufficient clearance to assemble the mica V ring and mica bushing. When the bore is machined the burr, which is dragged to one side of the bar by the boring tool, should be removed by a special engraving tool being drawn over the mica strip. This tool gives the bar a small radius as well as removing all copper "drag overs," thus increasing the creepage distance between bars.

The commutator bars should not be out of axial alignment more than the width of a mica strip. It is essential that the bars be parallel with the carbon so that the brush will short circuit the same bars at the front of the commutator as at the rear.

The distance from any bar to the corresponding bar under the next pole should not vary more than plus or minus $\frac{1}{32}$ in. This variation is controlled by keeping the variation of the copper bars and mica strips within the specified variation of plus or minus 0.001 in. If this variation is larger or smaller, sparking will be prevalent at these spots. This is equivalent to increasing or decreasing the width of the commutating zone while the brush setting remains constant. Consequently when a wider or narrower commutating zone passes under the brushes, they must short circuit bars connected to coils whose potential is not zero. Therefore, sparking will be prevalent at these points.

Assembled segments should be heated in an automatic temperature controlled oven at a temperature of from 125 deg. to 150 deg. C., before the Vs are machined.

The process of heating the assembled commutator segments before the Vs are machined is neither to drive out the moisture nor to get rid of the excess bond, as the mica plate should not contain live bond which will squeeze out. They are heated above the maximum temperature to which they will be subjected in service so that the bond in the mica, which is hard when it is cold, will soften and conform or adjust itself to the irregularities of the bars. This allows the clamping ring to draw the individual bars into a tight arch-bound assembly under maximum temperature conditions to which it will be subjected in service. It is this adjusting quality of mica which makes the breathing action of a commutator possible when it passes through the alternate heating and cooling periods in operation. The use of mica plate, which does not have the bond seasoned, should be avoided for use as commutator strips, as the bond will squeeze out.

Heating softens the surface shellac, thus cementing the copper bars and mica strips into a solid body. This facilitates assembling when the banding wire is cut. This cementing action of the surface shellac on the mica strips also keeps the oil and moisture absorption at a minimum.

The Vs of the assembled segments must be machined with a machine tool held in a positive slide set for each angle. This insures that the 30-deg. and 3-deg. angles will always be symmetrical with the gage line, thus insuring absolute interchangeability and a tight-fitting job when the commutator is assembled. If the angles are not symmetrical, the 30-deg. angle may be 29 deg., thus making the 3-deg. angle 4 deg. It can be seen

that, with this condition, a space will be left between the 3-deg. angle of the copper and the mica V ring. When this happens, it is necessary to remove the V ring and build it up so as to make the commutator tight at this point, thus keeping the oil out.

The gage diameter of the assembled segments must be machined so as to relieve the arch-bound pressure between the bars sufficiently to permit a "V-bound" or "opened-up" commutator. This has been discussed in the preceding part of the article.

The machined Vs must be gaged with a permanent male bridge gage, while they are held by the steel clamping ring. The use of this gage has been discussed.

The 3-deg. angle of the assembled segments must be machined so that it will form a tight joint between the copper bars and the mica V ring, thus keeping the oil and moisture from penetrating the commutator.

All burrs and copper drag-overs from the machining operation in the Vs must be removed by running an engraving tool over the mica strip between the bars in the Vs. The machined Vs should be painted with a coat of thin shellac. This protects the Vs from dirt, oil and moisture while in storage.

The milled slots for the conductors should have the bottom corner at the rear of the slot rounded. If a sharp edge is allowed to remain at this point it may cause a nick in the armature coil lead, thereby increasing the possibility of broken leads.

The milled slots should be coated with pure resin flux to eliminate corrosion and to facilitate the soldering of the leads when winding the armature.

Where the assembled segments are to be used with a two-piece mica V ring, a duct must be machined in the bottom of the Vs for the clearance of the mica V

ring. A 500-volt bar-to-bar test should be made to show up any possible short circuits. If any are found, they should be cleared before shipping.

Duisburg Installs Articulated Car

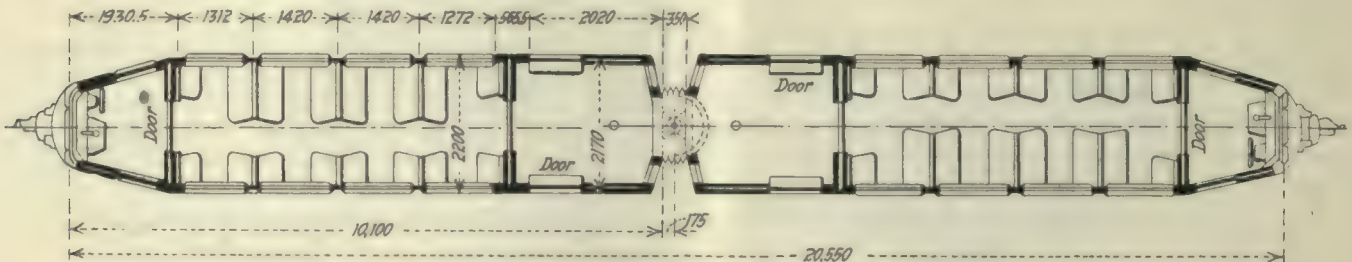
GERMAN street railways, like those in the United States, are experimenting with articulated cars, and the latest installation in that country is a two-body, three-truck car recently put in service by the Duisburg Street Railway. *Verkehrstechnik* declares the car is giving satisfaction, and the ability of passengers to transfer from one car body to the other has proved a great convenience over the former practice of running a motor car and trailer with no such facilities. The main dimensions of the car follow:

Length over all (exclusive of bumpers) ..	20,550 mm., or 67 ft. 5 1/2 in.
Truck base (between the centers of adjoining pairs of trucks)	7,033 mm., or 23 ft. 1 in.
Wheel base of trucks	1,700 mm., or 5 ft. 6 in.
Outside width	2,200 mm., or 7 ft. 3 in.

On account of the narrowness of the car body, it is possible to install seats for only three persons across the car width, as shown in the plan. This practice, which is necessary in many German street cars on account of the narrowness of streets, cuts down the carrying capacity, which in this car is as follows:

Standing load on end platforms	12 passengers
Standing load on inside platforms	40 passengers
Standing load in aisles	4 passengers
Seated load	44 passengers
Total	100 passengers

The middle truck is built under the Jacobs patents, mentioned in connection with articulated cars in Berlin on page 259 of the issue of this paper for Feb. 14, 1925. The entire car has two motors, one on each of the end trucks. The vestibule is of the bellows type.



Plan of Duisburg Articulated Car with Dimensions in Millimeters



This Articulated Car Has Capacity for 100 Passengers



Building Up Worn Journals of Car Axles by Automatic Arc Welding in the Shops of the Worcester Consolidated Street Railway

Building Up Worn Surfaces by Welding*

This Is the Largest Field for the Welding Process in the Railway Shop—Worn Faces of Yokes, Brake Rigging, Brake Heads, Journal Boxes and All Truck Parts Can Be Built Up to Good Advantage—Motor Frames and Housings Offer Large Field for Economical Repairs

By *W. L. Harwood*

Engineer of Power and Equipment Springfield Street Railway and Worcester Consolidated Street Railway, Springfield, Mass.

SHOP welding was begun on the Worcester and Springfield electric railway properties, with which I am connected, in 1915, eleven years ago. At that time two Indianapolis resistance type welders were purchased. Besides using them for trackwork they were employed to repair broken motor cases, gear cases, and the like.

Since then we have purchased much more elaborate shop welding equipment. In 1916 two Lincoln bonding machines were bought for track bonding. They were used on both properties for electric shop welding. In 1917 we purchased two acetylene outfits, and in 1919 we installed the first motor-generator sets strictly for shop welding. In 1920 we purchased our first automatic welders, so we have had a very complete welding plant on both the Worcester and Springfield properties for more than six years.

In Springfield the plant consists of a conveniently located welding room with a 300-amp., constant-potential welding motor-generator set, a 175-amp., constant-

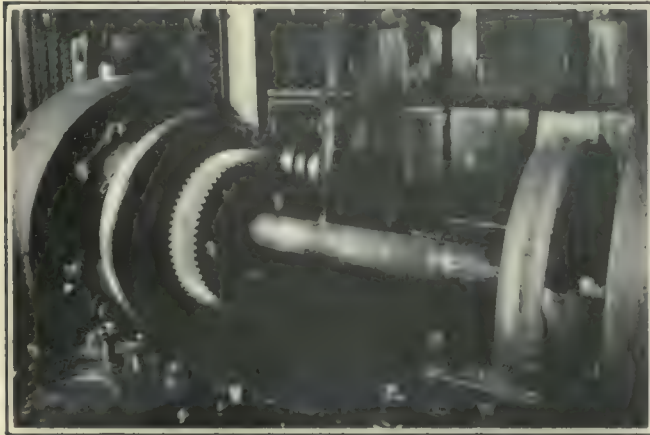
potential set and automatic welding equipment with a specially equipped lathe for automatic welding.

In Worcester the arrangement is somewhat different, the welding being done in a series of seven rooms that have corrugated iron partitions, the doors being protected by canvas curtains. Two of these rooms are for automatic welding and five are for manual welding. These booths are equipped with two 300-amp., constant-potential motor-generator sets, a 200-amp., constant-potential motor-generator set, a 175-amp., constant-current set, a type "W" dynamotor, which, although purchased originally for track welding, is at the present time being used by the shop, and two automatic welding equipments used in connection with lathes arranged for this class of work.

The welding force consists of two welders in Springfield and provision for five operators in Worcester. At the present time we have four operators. The welding rooms on both properties are served by a system of overhead trolleys with hoists to facilitate the handling of work as much as possible. The walls of the booths are painted with an ultra-violet protective paint.

*This article is based on material given in a paper before the New England Street Railway Club, Boston, Mass., Oct. 28, 1926.

There are many fields for electric welding, probably the largest being the manufacture of new equipment, but we do not believe that manufacturing is a field of the electric railway repair shop. During the war, also, when supplies were hard to get, the welding equipment was called upon to make repairs to parts when new parts could not be obtained and where otherwise it would have meant holding cars out of service. We have found that the largest field for electric welding in



Finished Pair of Wheels after Having Worn Flanges Built Up by Automatic Arc Welding

electric railway repair shops, at least in our shops, is to build up worn surfaces on all kinds of motor and truck parts.

It is difficult to give a good idea of just what parts we reclaim. A list of the articles we weld would look very much like a parts catalog for truck and motor equipment. As the equipment goes through for overhauling, however, all parts with worn surfaces, bolt holes, etc., are filled up and redrilled. Worn surfaces such as on yokes, brake rigging, brake heads, journal boxes, etc., are built up and machined where necessary.

We have rebuilt some 611 motors, both of the older split-frame type and the later box-frame type. In the case of the split-frame motors, such as GE-67, GE-80 and GE-87, the axle and armature bearing housing surfaces are built up where they are worn. All bolt holes in the case are welded and the worn surfaces where the motor is split are built up by welding. When the case leaves the welding room it is practically a rough casting, the only machined surfaces being the pole-piece pads and the holes where the pole pieces are bolted on. These latter surfaces, of course, do not wear. The surfaces where the two halves of the frame are bolted together are then planed. We have this work done in an outside shop, as we found one which was glad to get this work at a reasonable price. The bolt holes are then drilled, using a drilling jig which bolts to the field pad surface. This jig insures correct location of holes in the case and also insures interchangeability.

The next operation is to rebore the axle and armature bearing housings. This work is done in a No. 31 Lucas horizontal boring and milling machine. We have a simple jig for setting up the motor in the machine, consisting of a drum of the proper diameter to fit inside of the pole-pad surfaces. It is simply necessary to set the casing on this drum and bolt it in place, using the bolt holes provided for fastening on the pole pieces. Westinghouse 101-B motors are treated in a similar manner, except that in the case of the No. 101-B we

rebuilt the motor to make it into a No. 101-B-2. In redrilling the bolt holes we relocate them and drill them for 1½-in. bolts in place of the 1-in. bolts used on the No. 101-B. We install a newer type of armature bearing housing and also change the brush-holders to the stud type.

In the case of box-frame motors, the wear is in the axle and armature bearing housings. These are built up in some cases without removing the field coils. The armature bearing housings are machined in a wheel boring mill and the axle bearing housings in the horizontal boring mill. Worn pinion fits on armature shafts are built up by electric welding, the old keyway being filled up, a new taper turned and a new keyway cut. This is the process used with carbon steel shafts. We understand, however, that this practice is not recommended for the heat-treated alloy steel shafts we are now using.

Six years ago we installed our first automatic welding equipment, and found that it was possible to do a class of welding not practicable with the hand process. For example, we had experimented more or less successfully with building up axles by hand welding. I remember especially the first axle we built up by this method in Springfield. It was a 6-in. axle and the job looked good, but when we put it in a lathe we found that it was very badly sprung. As we did not have a sufficiently powerful axle straightener at that time we had to call on the track department, which was able to do it with a rail straightener. The job was a success but expensive. We overcame the springing of the axle with hand welding, but the automatic process we find to be much cheaper and there is no comparison between hand and automatic welding as regards uniformity and quality of the work which can be produced. At the present time we are welding our axles entirely by the automatic process and are using a rod covered with a flux, outside of which is a sheath. We find that this rod gives a much cleaner weld, especially on axles



Car Wheels with Rebuilt Flanges and Axles with Bearing Surfaces Built Up

where there are axle-bearing and journal-bearing fits. By welding up our axles we are able to keep the axle and journal bearings well up to size, increasing the life of the journal and axle bearings. This likewise increases the life of gears and pinions, and, of course, reduces the expense for new axles.

Our first welding of steel wheels was with the automatic machine and was successful. We build up the flanges on all worn steel wheels before turning. In this way it is seldom necessary for us to touch the tread surface. This adds to the life of the wheel.

First, we get all the wear there is in the tread rather than turning it off to get stock enough to get a proper flange contour, and, second, it preserves the hard-rolled tread surface, which we believe wears longer than the newly turned surface. Our figures show that welding adds from 60,000 to 100,000 miles to the life of our steel wheels. As regards economy of this shop welding as compared with the purchase of new parts, we make it a general rule that no parts shall be reclaimed where the cost of reclaiming exceeds one-half the cost of a new part. It rarely costs us that much and often a few cents will reclaim an expensive part. However, all costs in an electric railway shop have to be carefully watched, and it is quite possible as a shop gets started in welding to become over-enthusiastic and weld parts which had better be replaced by new. A few average costs for this work are: for labor and material to weld one steel wheel, based on the average of a considerable number of wheels, \$3.25, and labor and material to weld and re-machine one GE-67 motor based on the average of a number of motors, \$28.62.

For a number of months we kept a record and made out weekly reports of all work done in the welding department, the cost of the work, cost of new parts, and saving. The saving ranged from 50 to 97 per cent, or, in other words, the welding cost from 3 to 50 per cent of the cost of new parts. A rough average would indicate a 75 per cent saving and that our cost of welding averages about 25 per cent of the cost of new parts. The actual dollars and cents saving varies, of course, with the class of work which is going through the shops. On running over the reports, I find one week in Worcester where this ran as high as \$1,400. In any event, the saving is very noticeable in our equipment accounts and in the reduction of scrap accumulation.

We are making a considerable saving by welding flanges of steel wheels and have been successful in this from the start. We have had but few failures and believe this is the experience of other roads which have tried the welding up of flanges.

In working up information, I endeavored to get complete records of new wheels which have been welded and finally worn out. I found it to be practically impossible as there were no welded wheels which had been worn out, although we found a great many welded wheels in service. The worn-out wheels had never been welded and had made from 105,000 to 155,000 miles, the average being around 125,000 miles. Wheels which have been welded make an initial mileage of from 60,000 to 100,000 and after welding we obtain about 60,000 to 70,000 additional car-miles before the wheels are welded again. We have some wheels which have been welded several times. The wheels which we have welded are principally 34-in. wheels, but we have done some 22-in. and 26-in. wheels.

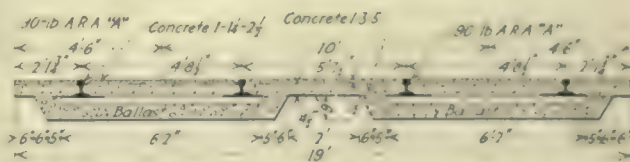
The question has come up a great many times as to the effect of welding of car axles on the strength of the steel. Our records indicate that there is no more breakage with welded axles than with axles which have not been welded. We thought at one time it might be advisable to heat treat old axles, especially after they are welded. This, I believe, is being done by other properties. We have some such axles under test at the present time and have photomicrographs which show the character of the weld and axle before and after heat treatment. So far, however, our experience has not shown that heat treatment is necessary.

Light Steel Tie Construction Used at El Paso

STANDARD section heavy T-rail, steel ties laid on a bed of stone ballast with a 6-in., two-course concrete pavement, is a type of track construction developed by the El Paso Electric Company. According to the brief presented by the company in competition for the Charles A. Coffin prize this year the original cost of this construction is approximately \$1 per foot less than any



Track with Concrete Paving on a Stone Ballast Foundation on Alameda Avenue, El Paso



Standard Track Construction of the El Paso Electric Company Includes T-Rail Laid on Steel Ties on a Ballast Foundation. Paving Is a Two-Course, 6-in. Concrete

other equally satisfactory type. Moreover, it is easy on rolling stock, because of its resilience, and replacements and repairs, when these become necessary, are comparatively easy.

After an experience of six years the railway is convinced that concrete pavement is better for the track area than brick or asphalt, besides being cheaper. In this construction the concrete is used solely for paving and not in any way as a support for the track, although, incidentally, it serves to prevent water from getting into the foundation.

Two big jobs were completed during the past year where concrete pavement was used on ballasted track with wood ties. The use of a good grade of oak or pine ties untreated has further reduced the original construction cost and is fully justified on light traffic lines, the management believes. Rail sections were adapted to meet local conditions, both 90-lb. rail and 75-lb. rail being used with success.

In ballasting and tamping track the roadbed is thoroughly wet down and the ballast tamped pneumatically. Cars are allowed to operate over the track all the time to shake it down. During the concreting operations the constant passing of cars is thought to help to work down or tamp the concrete, and as laborers are on the job immediately ahead of the location where concrete is being poured they can watch for and make solid any loose ties.

Northern Ohio Modernizes Cars

Both Interurban Equipment and Cars Used in Akron Have Been Rebuilt to Give Up-to-Date and Comfortable Service

FORTY-SIX cars of the so-called "600" type, constructed by the Kuhlman Car Company twelve years ago, are being rebuilt by the Northern Ohio Power & Light Company into cars for one-man operation. They are being patterned after the Peter Witt type of car. The cars were originally constructed for heavy peak loads. The length over all was 46 ft. In the reconstruction 2 ft. is being taken off the rear of the car and circular seats to care for seven passengers installed in the well. In this manner the car is reduced in length to 44 ft., but the seating capacity is increased to 58 instead of the original 54. The entire seating plan is being rearranged, longitudinal seats being put in front. The old rattan seats are covered with heavy layers of felt and imitation brown leather put over this. The result is far more attractive and more comfort-

Rear When Car Stops." The car also carries a stop sign that lights up when the brakes are applied.

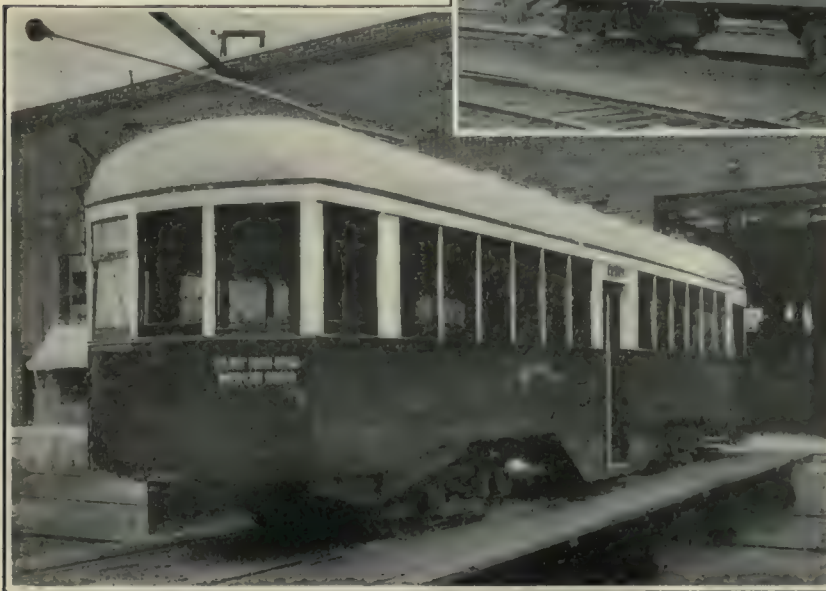
The new company colors, red body, green stripe with cream top, are used instead of the former yellow.

It has not been necessary to change the motors. They are of the Westinghouse 307-V type. The car has speed, is of composite steel, easy riding, and is of the best type of construction. The reconstruction costs are comparatively low.

The cars used on the Canton-Akron-Cleveland interurban line are known as the 1500-type. Bought several years ago, they are of steel construction and are still in good physical condition. Some two years ago the company adopted the seat cover plan to add to cleanliness and this brought public approval. The covers were



Above, Old Akron Car Before Remodeling. At Left Exterior and at Right Interior of Remodeled Car



able seats than the old ones. These seats, with the lower part of the car in mahogany and the upper in white, make for a car that is pleasing to the public and one that has brought words of praise from passengers.

A center door, operated by a treadle, has been installed and the steel sheathing extended down to give the car the appearance of being low. It has been necessary to put in three steps. The steps are 9½ in., but the use of three has brought the first one nearer the ground than the steps of a Peter Witt car. Entrance to the car is at the front and exit is from the center doors.

All safety features are being installed for one-man operation and the cars will be used in Akron city service. Incidentally, all city lines in Akron, with the exception of two, are one-man operated.

One of the improved features from the standpoint of the public is the electric sign in front of the car, just behind the motorman, reading "Exit at Center." The sign lights when the brakes are applied. Another sign, on the rear of the cars for motorists, reads: "Do not pass

changed daily. Now the company has gone a step farther. The leather seats have been taken out and plush seats installed in the main compartment. New individual leather seats have been placed in the smoker. The Hale-Kilburn type seat is used.

In the changing process four seats are being lost. The interurban car formerly seated 54; it now seats but 50. This adds to the comfort of passengers and gives plenty of room for hand luggage, etc.

The old windows were removed and fourteen new windows 56 in. wide installed, using non-splinter plate glass. This gives passengers a clear view through the window. O. M. Edwards brass sash is also used.

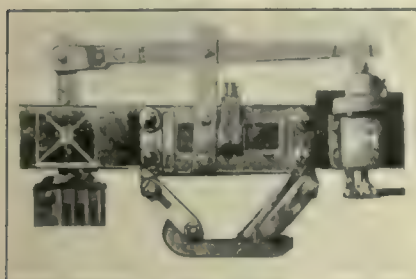
The floors are covered with live rubber, the product of the Goodyear company. Toilet facilities have been added to and improved. As no excess fare is charged, the Ohmer register is retained.

The exterior of the car is the company's standard red. The interior woodwork is of gray to match the gray of plush seats, while the ceilings are in white. All work has been done in the company's shops in Kenmore.

Maintenance Notes

Air-Operated Third Rail Sleet Scraper

SLEET scraper equipment for the third rail has been developed in the shop of the Lackawanna & Wyoming Valley Railroad, Scranton, Pa., and is now being installed on cars for winter service. It is air operated. The equipment consists of a 3½-in. x 4-in. air cylinder, scraper and connecting lever. The cylinder is bolted



Air-Operated Third Rail Sleet Scraper, Showing Scraper, Connecting Lever and Air Cylinder

to the shoe beam at the right and the scraper at the left of the third rail shoe, both being connected with a lever fulcrumed to the shoe beam. The scraper consists of a ½-in. x 2-in. steel shaft, steel scraper head and a set of scraper blades consisting of four ½-in. x 3½-in. x 6-in. steel plates set at an angle of 60 deg., spaced ½ in. apart and bolted securely to the head. A hole is provided in the shoe beam to permit of the free vertical movement of the scraper shaft. Pipe connections from the air cylinder to the motorman's cabs, with suitable operating valves, permit of operation

when desired. When not in use a pin is inserted through the scraper shaft and rests upon the top of the shoe beam, preventing accidental operation.

It is stated the scraper blades will give service of about 200 miles and prove a very effective method of removing ice and sleet from the third rail contact surface.

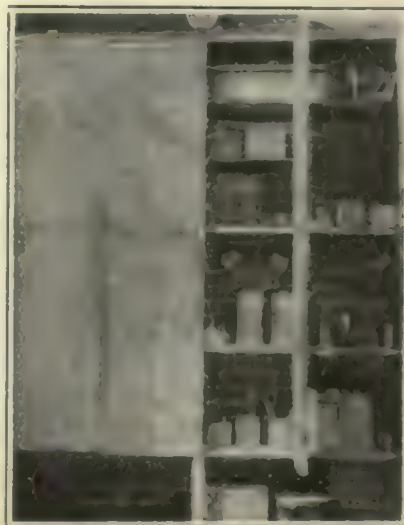
Preventing Vibration of Armature Coils

CONSIDERABLE trouble was experienced with open circuits in armature leads where they bend down to the commutator on type GE-70 armatures in service on cars of the Grand Rapids Railway, Grand Rapids, Mich. With the original method of winding these armatures, the leads were bent down into the end bell, which not only required a sharp bend in the lead, but also was often likely to leave these unsupported if the bends were straightened slightly. An accompanying illustration shows an armature with the old type of winding and also a coil at the top with the sharp bends in the armature leads. In order to overcome these troubles the sharp bends were done away with by bringing the leads down straight from the coil end to the point where they were soldered in the neck of the commutator. This straightening of the leads left a space underneath, which was filled in with asbestos rope. The leads and rope were painted with an insulating varnish so that when com-

pleted a firm support was provided. This has effectively prevented the trouble of open circuits.

Lockers Used for Storage of Paints

CARELESS storage of paints, oils and varnishes necessarily increases the fire hazard. To prevent this, James Brown, master mechanic of the Wilkes-Barre & Hazleton Railway, Hazleton, Pa., has devised a very simple but effective cabinet. This consists of four ordinary wire

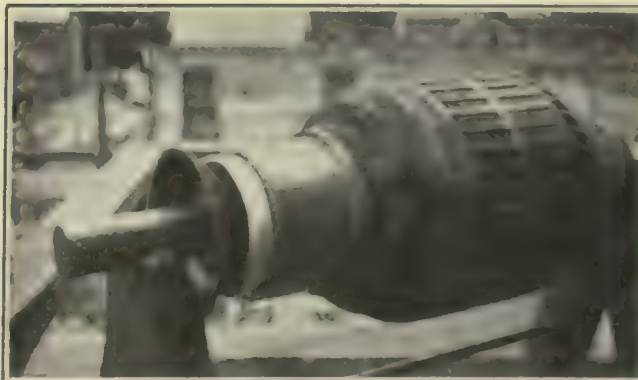


Clothes Lockers Converted into Paint Storage Cabinet

mesh clothes lockers. The wire backs were removed, the ends and doors covered with sheet steel and suitable metal shelves were installed. These lockers were mounted against



With the Original Winding the Armature Leads Were Bent Down Into the End Bell, Thus Requiring Sharp Bends in the Leads, Which Broke and Caused Trouble



With the New Method of Winding the Leads Are Brought Down Straight to the Commutator and Are Supported Underneath by a Winding of Asbestos Rope

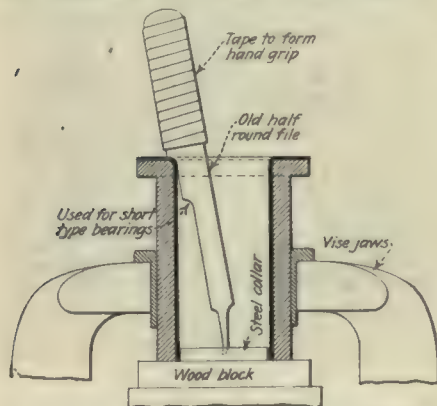
a brick wall and fastened securely.

All paints, oils, brushes and varnishes are placed in this cabinet at the close of the day. This gives the shop a very neat appearance and at the same time decreases the possibility of fire.

*Reported "OK" bearings suggests
"O"iled "K"arefully.
Reported "BO" bearings suggests
"B"adly "O"iled.*

Bearing Flanges Rounded Quickly

ARMATURE bearings are bab-bitted to size in the Harvard shops of the Cleveland Railway. The flanged ends are also brought back to standard thickness by applying a layer of babbitt. After being poured the bearings are passed to a finisher, who trims off the ragged edges and rounds the flanged ends of the bearing. The tool used for this operation consists of an old half-round file carefully ground so as to provide a cutting edge and accurate radius for the rounded portion. The top portion is wound with tape to



A Half-Round File Accurately Ground with Cutting Edges Is Used for Rounding the Flanged Ends of Armature Bearings in the Harvard Shops of the Cleveland Railway

form an easy grip for the hand. The bearing is placed in a vise with the unflanged end resting upon a special block. The top of this block has a steel collar that fits inside the bearing. This block has a hole in the center, into which the sharp end of the cutting file is placed. Then by rotating this around the inside of the bearing the flanged end is given the desired radius. This provides a quick method for rounding the inside of the flanged ends and the cutting tool is arranged with offsets at different heights, so that different length bearings can be rounded with the same tool.

Dick Prescott Simplifies Maintenance

But Trouble Continues to Brew



PETE WELCHER, chief inspector in the Consolidated Railway & Light Company's shop, carefully nursed his grudge against Dick Prescott, newly appointed assistant superintendent. He lost no opportunity, in speaking with various workmen, to disparage Dick's ability by carefully guarded remarks suggesting contempt for the young executive. At the same time, his henchmen—"Slowfoot" Lewis, "Lefty" Kooms and "Shorty" Green—did their part in spreading the seed of discontent among the various workmen in the shop.

Totally unaware of this propaganda and the faint mutterings of trouble which it succeeded in arousing, Dick busied himself with the task of cutting out lost motion in the shop through proper planning of maintenance procedure. He spent considerable time in the storeroom and inspected carefully the requisitions received from various departments. He discussed these with the storekeeper and discovered many opportunities for eliminating confusion by reducing the number of different types and sizes of given parts ordered for replacement.

As this program continued, orders for new material were limited to certain selected standards and all other types and sizes formerly used were put on the obsolete list. As cars came through the shop for overhauling it became the practice to equip one or more of each series complete with new standard parts. The obsolete material removed was held for use in making individual repairs and replacements until the stock became

exhausted, whereupon another overhaul car was stripped and equipped with standard parts.

Dick found that this gave an opportunity for materially improving the procedure followed in ordering spare parts from manufacturers. It had been customary to place many small orders for comparatively minor repair items as the need arose, with little effort at consolidation of such orders into reasonable commercial quantities. The wide variety of parts required, some of which were for use on very old equipment, still further aggravated this condition. As a result, many of these orders were unattractive to supply houses and manufacturers, although the costs of such parts were high and deliveries very uncertain. The policy of reducing variety in spare parts helped to relieve this situation. George Stewart, the storekeeper, who at first was skeptical of the new plan, soon became openly enthusiastic. As time went on he found that the reduction in the number of types automatically made it possible to consolidate items and to order parts in commercial quantities.

With opportunities thus opening on every hand for improvements in the shop, Dick was too intent and busy with the job to be aware of the activities of his enemies. But matters were coming rapidly to a serious situation. One day, as Dick passed the door to the little office of his friend Steve White, carpenter foreman, the latter hailed him and beckoned him inside. As Dick entered the little office, Steve carefully shut the door.

Overhauling Methods of the Pacific Electric Railway

By F. E. GEIBEL

Assistant Superintendent of Equipment
Pacific Electric Railway, Los Angeles, Cal.

GENERAL overhauling and heavy repairs to electrical equipment operated by the Pacific Electric Railway are done at the general shops and running repairs and inspection at the division shops. The general shops are located at Torrance and were described in *ELECTRIC RAILWAY JOURNAL* for July 21, 1917, and Aug. 17, 1920. As an indication of the large volume of work done at these shops by the mechanical forces, this year's program includes the complete overhauling of 350 cars and 72 motor coaches. In addition to this, much work is done in making repairs necessary to restore to service equipment damaged by accidents.

Cars for general overhauling are brought into the shops on tracks adjacent to the scrub room. On these tracks the car is inspected and the necessary repairs are determined upon. The car is stripped of cushions and other trimmings of the body and is then moved to the scrub room, where it is cleaned thoroughly by a steam process. After this cleaning, the paint surface, if in good condition, is ready for repainting. It may be necessary, however, to remove the old varnish with ammonia or burn off the old paint before refinishing. Paint is removed from steel cars by sandblasting and a special room is provided for this work. After this work is done the car is moved to a track in the air room, where the trolley base and air compressor are removed and replaced with newly overhauled ones.

In the erecting shop the car is jacked up and placed on stands. The trucks are sent to the truck shop and air and electrical equipment needing repairs are removed and sent to the control and air rooms for this work. While the various equipment is being overhauled carpenters and cabinet makers make necessary repairs to the body, underframe, sash, doors, etc. After the equipment is repaired and replaced and pipemen and wiremen have cleaned, checked and adjusted both air and control equipment the car is again ready to be placed on trucks.

Sandblasting is used extensively in connection with truck overhauling, as this removes dirt and rust so that a close inspection can be made for defective parts. Wearing parts are

renewed or built up by welding. Wheels are removed, renewed, turned or ground, as may be necessary. Armatures are removed from the motors and are cleaned and dipped in insulating varnish, after which they are baked. Equipment for this process has been installed but recently. Dipping and baking fill in the pores of the insulation and cement the coils solidly in the core slots. This prevents vibration and consequent wear of the insulation, which is one of the principal causes for grounds in armatures. After the fields have been renewed or repaired the entire motor case is painted inside with insulating paint and the motor is then assembled on the truck. In the interval, brush-holders and connections have been repaired or renewed. After a very thorough running test

Locked Receptacle for Package Goods

TRANSPORTING loose parts and small package goods from the main storeroom to electric railway shops often constitutes quite a problem. This refers particularly to such material as screws, fuses, small commutators, small reels of copper wire, shunt wire, silk tape, brass brush-holder parts, etc. In order to provide a sturdy receptacle for such materials which can be handled easily and also to provide for locking so that the contents cannot be tampered with until the destination is reached the Brooklyn-Manhattan Transit Corporation uses what is called a "Tote" truck. Ordinarily these trucks are used in pairs, the one in the storeroom being loaded up while the one



Receptacle on Wheels Provides a Handy Method of Transporting Small Package Goods

of the motors the trucks are sent back to the erecting shop.

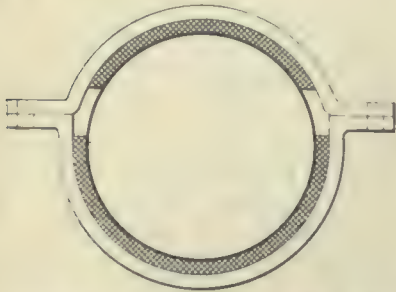
With the car body again placed on its trucks the car is sent to the paint shop, where repairs or repainting are done. The process used by this railway is the color and varnish system, which so far has proved more satisfactory than either the enamel or lacquer systems. Removable parts, such as seats, gates, equipment boxes, trucks, etc., have the paint applied with a spray gun, but the brush system is used for painting the car body itself. After painting, air men and electricians complete any small adjustments and test out all equipment. The car is then trimmed, which consists of replacing all seats, curtains, sash, locks, signs, etc.

at the shop is exchanged for the loaded one each trip. These trucks are made of sheet iron and are 3 ft. x 4 ft. x 2 ft. high. The cover is hinged at one side, while at the other a clamp provided with a padlock keeps the receptacle closed. The padlock is provided with two keys, one of which is held by the storeroom and the other by the consignee. For rolling about the shop and storeroom two sturdy wheels are provided in the center on each side and a smaller wheel in the center at each end. Bails are provided for handling and pulling the truck. There are four on top, one at each corner, to make loading of the truck onto the supply car by means of a hoist or crane an easy performance.

Preventing Oxidation of Air Tanks Under Hangers

INSTALLING a strip of canvas soaked in oil and white lead between the air tank and the tank hanger is preventing the oxidation of air tanks under hangers on the cars operated by the New York Railways.

Previous to the introduction of



The Shaded Part Is Canvas Strip Soaked in Oil and Lead and Placed Between Air Tank and Hanger

this method it was found difficult to force paint between the tank and hanger by ordinary painting methods, with the result that oxidation took place.

*Systematic inspection and careful tests
Will keep you out of a "hellofa" mess.*

Another Use for the Sand Blast

THE Indiana Service Corporation, Fort Wayne, Ind., had some wicker chairs which were used in buses. These chairs had been painted, and in overhauling them it was desirable to clean the old paint off. It was very hard to get under the reeds where they cross each other and the usual process of cleaning was quite tedious. Arthur Redderson, superintendent of motive power, conceived the idea of trying a sand blast for removing the paint. The air pressure was choked down to 45 lb. and particular care was used not to keep the blast on one place for too long a time as there might be danger of cutting the reeds. The method worked out well and much time and trouble were saved. This company has also used the sand blast for removing paint from canvas roofs where the painting has become badly alligatored. Mr. Redderson believes that the sand blast will work well for removing paint from cane seats with proper care.

New Equipment Available

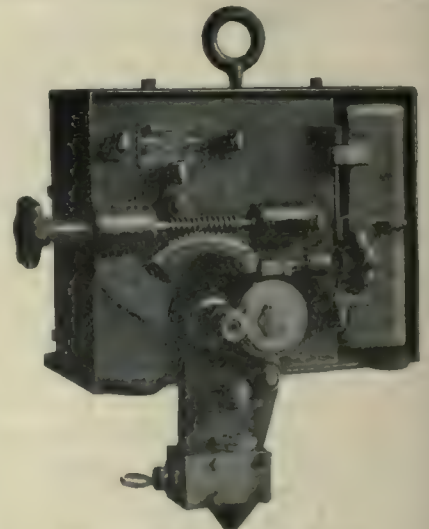
Motor-Driven Portable Air Compressor

SUFFICIENT air capacity to operate a hammer rock drill, a heavy-duty concrete breaker or two or three spades for digging clay is possessed by the Sullivan portable air compressor. The machine is driven by a direct-connected electric motor and has a capacity of 103 ft. of air per minute. The design embodies two vertical cylinders, single acting. These are splash lubricated with positive control of the amount of oil reaching the cylinders. Both the compressor and motor run at a uniform speed of 750 r.p.m., the even turning movement being insured by a heavy flywheel inside the compressor casing.

The whole rig is mounted on a cast-steel frame of a deep and heavy section and is protected from the weather by a canopy top. Water circulation for the compressor cylinder cooling is by means of a small centrifugal pump driven by a little pulley on the crankshaft. The machine may be mounted on steel wheels, or, if desired, on a Ford truck. It may also be mounted on a trail type truck with spring suspension and rubber-tired wheels, or on a timber skid. A similar unit of double the capacity has also been placed upon the market by the Sullivan Machinery Company. One of the units described was on exhibit at the American Electric Railway Association convention in Cleveland, being connected up so as to show actual operation on a track job.

Automatic Feed Machine for Arc Welding

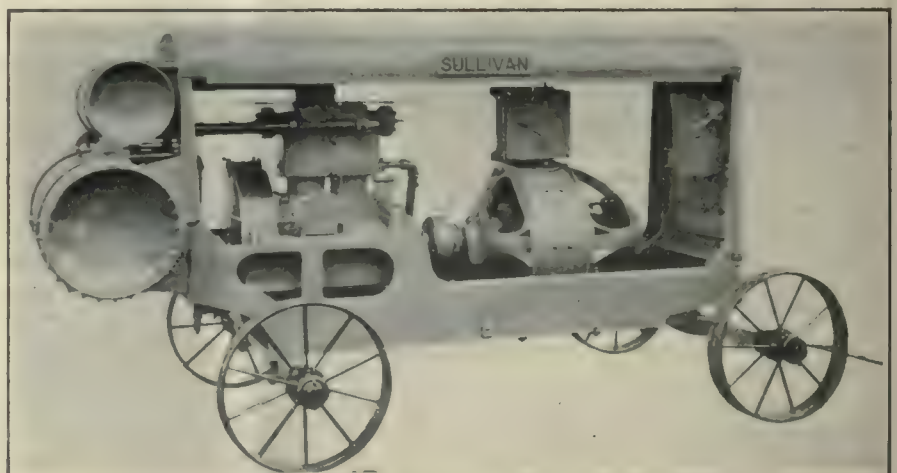
A MACHINE for automatically feeding a continuous welding wire to the work at any speed up to 3 ft. per minute, which is necessary to maintain a constant arc length and a constant arc voltage, has just been brought out by the Westinghouse Electric & Manufacturing



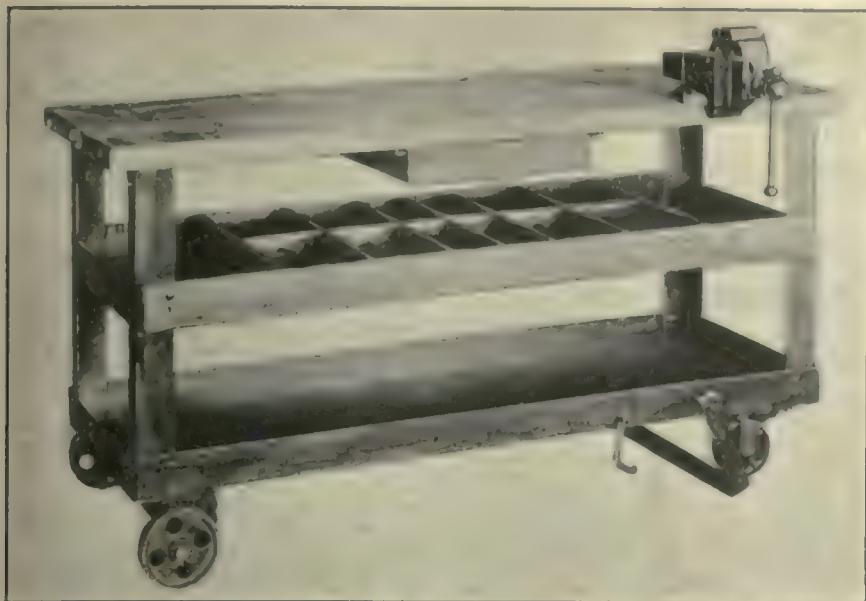
Arc for Welding Automatically

Company. This machine strikes the arc automatically and if necessary will exert a pull of approximately 200 lb. in order to prevent fusion of the electrode wire to the work.

This device relieves the operator of the tiresome and exacting hand labor of maintaining the arc and feeding the welding wire, and, due to the electrical conditions of the arc remaining practically constant, it is



Compressed Air for Various Track Repairs Is Furnished Most Conveniently by a Motor-Driven Unit of This Character



Time and Energy of Workmen Are Saved by Use of a Portable Workbench

possible to secure a better weld and to deposit metal very much faster than can be done by hand welding. The arc length can be adjusted so that the arc can be maintained at an average value of from 15 to 20 volts and will remain almost constant at any given voltage. The $\frac{1}{2}$ -hp. feed motor and the electromagnets do not obtain power from the arc circuit and are therefore selected large enough to feed any size wire up to $\frac{1}{8}$ in.

This automatic arc welding equipment can be used to best advantage on work requiring the welding of long, continuous seams and also for some repair applications, such as building up worn surfaces. It is also applied in building up worn flanges for electric railway car wheels.

It has many advantages, including better fusion due to the use of a higher current, ease of operation, permitting an inexperienced operator to handle it; uniformity of deposit, making better quality work, and the reduction in costs due to the ability to use wire in continuous lengths and eliminating the necessity of straightening and cutting. Other features of this equipment are dirt-proof housing and ease of accessibility to parts.

Movable Workbench Saves Steps

IN ELECTRIC railway repair shops stationary workbenches are most commonly built along the walls. Materials to be repaired must be removed from the cars or other equipment and carried to the bench. Many

times the distance between cars and benches is considerable and much time is lost by workmen. To provide a portable bench which can be moved to a convenient location and thus save many steps and energy of workmen the Manley Manufacturing Company, York, Pa., has brought out one of somewhat novel type.

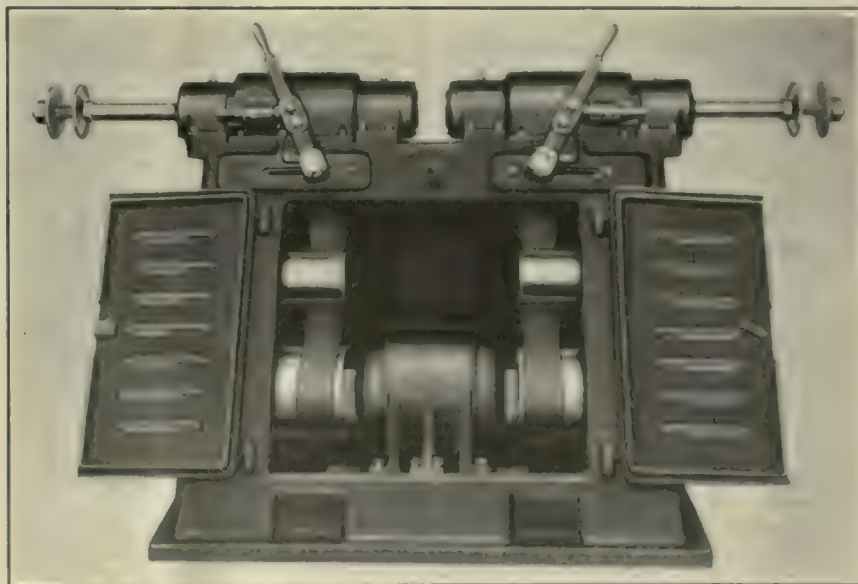
The entire workbench is of very substantial construction with a hardwood top, steel drawer, shelf partitions, roller bearing casters and provision for locking the wheels so that they will not roll about while the bench is in use. The bottom shelf of the bench provides a tray for large parts, and the intermediate shelf, with partitions, is conveniently arranged for the smaller parts. These portable workbenches are furnished

in two sizes, one with a top 44 in. x 16 in. and the other with a top 64 in. x 20 in. These can be furnished without the shelf partitions if desired.

Portable Selective Speed Buffing Machine

BY MEANS of belt shifters in rear of both spindles it is possible to stop either spindle independently of the other, on a new portable selective speed buffer just placed on the market by the Hisey-Wolf Machine Company of Cincinnati, Ohio. Working in unison with the shifter an adjustable brake engages when the belt is shifted on the loose pulley, thereby holding the spindle stationary until the belt is again shifted. The belt tension can be easily regulated by means of the lever at either end of the machine. As the machine is mounted on a hinged platform equipped with screw adjustment, it is possible to get still further regulation than that obtained by means of belt tension levers.

Twelve over-size ball bearings are used in the machine and full provision is made for adequate lubrication. As in other Hisey products, a full safety automatic starter with push button control is standard equipment. Two large doors in the rear permit full view and access to the entire machine. Various spindle speeds can be furnished to meet special operating conditions. If desired the spindles can be provided with a different speed on either end. This machine is made in three sizes with $7\frac{1}{2}$, 10 and 15-hp. motors.



Doors in Rear Are Open, Giving Access to Machine

Association News & Discussions

Utility Commissioners' Reports Consider Local Transportation Subjects

SEVERAL of the addresses and reports before the National Association of Railroad and Utilities Commissioners at its annual meeting in Asheville, N. C., Nov. 9-12, 1926, contain recommendations affecting the electric railway industry. A general report of the meeting was published in last week's issue of the JOURNAL. Below are given abstracts from those addresses and committee reports which contain suggestions or information of direct value to local transportation men.

In his annual address President A. G. Patterson referred to the situation of the various classes of public utilities with which state regulatory officials are concerned. Respecting motor vehicle transportation he spoke as follows:

"The growth and development of motor vehicle traffic, both passenger and freight, goes rapidly forward while regulation, at least from a national standpoint, is still inchoate and undefined. Many of the states, realizing their responsibility and mindful that 'a stitch in time saves nine,' have provided regulation for intrastate motor vehicle operations. Through the co-operative methods of this association, a considerable degree of uniformity in such regulation has been observed. The Interstate Commerce Commission has recently conducted hearings in a number of states for the purpose of assembling data and information upon which it will make a report and recommendations to Congress regarding regulation of this important and growing transportation business.

"Out of all the investigations and experience regarding motor vehicle regulation, it is becoming more and more apparent that existing local authorities should be employed as the agencies by which this regulation should be made effective. The peculiar nature of motor vehicle carriers, the fact that they must travel over highways provided largely by the states and counties and not over their own roadways, the fact that there will probably never be the same economic reasons for the ownership of such carriers or the operation thereof, to be consolidated or vested in one person, firm or corporation, operating across many states, and the manifest necessity for closer supervision than rail carriers require in order to protect the lives of the public and of passengers of such vehicles—these characteristics indicate not only that the states can best perform the task of regulating this traffic, but that effective regulation in this field is well-nigh impossible of performance by a single national body.

"The splendid work which has been accomplished by the committee of this association in preparing and presenting to Congress a bill providing practical regulation for interstate motor vehicle traffic furnishes further evidence of the great value of this organization to the public, and the bill so provided should, and we trust will, receive favorable action of the Congress. Until Congress does act, the states, of course, must confine their regulation wholly to intrastate operations.

"That state is an exception wherein the public welfare does not already demand that regulation be provided for intrastate traffic of this sort.

"State utility and railroad commissions and their staffs, as a rule, constitute the best equipped group of men in the state to formulate the basis and plan of regulation to be adopted by the Legislature. Such commissions can, and we think should, perform the service of submitting plans of such regulation to the legislative bodies. In devising such legislation the rights and interests of existing carriers by rail, or by boat, should of course not be ignored.

But we think the position is sound that if, with improved systems of highways, the motor bus and the motor truck can furnish to the people a more convenient, efficient and economical method of transportation, the people should not be denied the benefits thereof because the granting of franchises and certificates to such motor vehicle carriers to carry on business will necessarily result in some loss to the rail carriers or boat lines. If such motor vehicle transportation can be carried on for the people at a lower cost than rail transportation and the difference in cost is sufficient to warrant consideration, then we think that alone might justify the granting of a certificate to a motor vehicle carrier, even if the rail carrier traversing the territory was already in a position to carry all the persons and goods offered to it, but for the rendition of such service demanded a substantially higher reward. If we say that motor vehicle transportation should be denied because the rail carrier in the territory can carry all the persons and goods offered and hence should not be injured by such competition, when such motor transportation will be more convenient, more satisfactory and more economical, by the same token we should forbid the sale of electric lights because to permit it will injure the manufacturers of candles and oil lamps.

"The people are entitled to the benefits that will accrue from improved highways and the development of the motor vehicle just the same as they are entitled to the benefits accruing out of the advancement of science in any other field. If the railroads are confronted with a new problem in the form of this motor vehicle competition, then it is their task to solve the problem so far as it affects them, not to ask the people to solve it by prohibiting or strangling the motor vehicle business, if that is found to be an improvement upon previously existing transportation agencies, but solve it by improving their own methods of transportation so as to minimize as far as possible the advantages existing in favor of motor vehicle transportation.

"The man is foolish who holds the view that regulation should ever be exercised in such a way as to deprive the people of any better, more convenient or more economical method of carrying on their affairs."

PEOPLE ARE ENTITLED TO BENEFIT OF NEW METHODS

The committee on express and other contract carriers by rail also touched on automotive transportation in connection with the effect of such competition on the existing carriers. It held to the following views regarding the situation:

"Coming to the question of changes involved in the progress of events and with especial reference to the competi-

COMING MEETINGS OF *Electric Railway and Allied Associations*

Dec. 2-3—Highway Research Board—Division Engineering and Industrial Research, annual meeting. National Academy Sciences—National Research Council Building, Washington, D. C.

Dec. 3—American Electric Railway Association, Metropolitan Section, Engineering Societies Building, New York City, 8 p.m.

Dec. 6-9—American Society of Mechanical Engineers, annual meeting, New York City, Engineering Societies Building.

Jan. 10-14—American Road Builders' Association, convention and road show, Coliseum, Chicago, Ill.

Jan. 25—New York Electric Railway Association, winter meeting. Hotel Commodore, New York City.

Jan. 26-28—Association of Equipment Men—Southern Properties—Memphis, Tenn.

Feb. 3-4—Central Electric Railway Association, winter meeting, Toledo, O., Commodore Perry Hotel.

tion entailed in motor vehicle transportation, it is the view of the committee that while, as expressed in previous reports, motor vehicle competition with carriage of persons and property by rail should be carefully controlled and limited with due regard to the rights of existing carriers which have invested large capital and developed business in good faith to the great benefit of the various communities through which their lines run, yet it is nevertheless true as a general proposition that the people of any particular community are entitled, under reasonable conditions and with due regard to the rights of all others, to the benefit of new modes of transportation and to a full utilization of the vast outlays that they have made, through the medium of taxes, in improved roads as a means for such new and different modes of transportation.

"The theory upon which this conclusion is based is twofold. One is, that it is the right of the people, with due regard to the proper safeguards for the rights of others, to enjoy new facilities, new inventions, and be the beneficiaries of the progress of the times. As the rail carriers enjoy the right of eminent domain by virtue of the right of the people to have private property appropriated to public service, so the people have the right to enjoy to the fullest extent consistent with the rights of others their investments in the construction and improvement of roads which correspond, as to motor vehicle carriage, to the rights-of-way appropriated and occupied by rail carriers.

"The other theory is, that the existing rail carrier must be subject to the economic necessity of meeting the competition of newer and more desirable modes of transportation and take its chance of having to succumb thereto."

MOTOR VEHICLE TRANSPORTATION IS BECOMING STABILIZED

A review of the problems brought up by the development of motor vehicles is covered in the report of the committee on motor vehicle transportation, which is printed in full below:

"The rapid progress in the building of good roads, engineering skill in the perfection of motor vehicles, the ever-present tendency of the American people to make immediate use of new modes of rapid transit, have combined to force to the forefront and to clothe with all-absorbing interest the question of motor vehicle common carrier service. The effect of this service is far reaching and touches nearly every phase of our business, social and economic life. It affects the relationship between the wholesale and retail merchant; the relation between the rural towns and commercial centers, the transportation and financial questions of traction, express and railway companies. So acute have been the problems due to this new transportation and the efforts to allocate it to its proper place in the transportation world that the best thought of the country has been employed in an attempt at a wise and sane solution.

"Commissions and regulatory bodies in practically every state in the Union have been swamped with the many perplexing and seemingly contradictory

situations which have arisen. Inexperienced operators without seasoned judgment, promoters seizing an opportunity to exploit the business, selfish interests impelled by their own private financial motives, prejudice, jealousy, political exigencies and hysteria on the subject, have, at certain times, in certain places, almost imperiled the future of this new industry, destined as it is to play an important part in the future of this country. Time, however, and experience have been and doubtless will continue to be potential factors in solving the perplexing questions. In many places the problem of motor vehicle transportation is gradually adjusting itself and finding its place in the transportation needs of the communities in which it operates.

"Regulatory bodies are experiencing less difficulty in handling the questions which arise. This is due in part to the fact that operators are becoming familiar with transportation problems, and due in a large measure to the 'fly by night' operator, finding his business unremunerative, having quit the field. Another contributing factor toward solution of local operation is due to the change in attitude of the other forms of transportation toward motor vehicle operation and in the change of attitude of motor vehicle operation toward the former. At first the officials of electric and steam roads felt that this new transportation would so deplete their revenues as to threaten the value of their invested capital and that they owed a duty to those who had invested in their securities to make unremitting warfare against the new business. On

the other hand, bus and truck operators were led to believe by propaganda put out by promoters and certain manufacturers that their business was in the near future destined to supplant the older forms of transportation and they should make every effort to enter into active competition with them at once. Fortunately for the transportation needs of the country these notions are quickly being dispelled and in their place a fine spirit of co-operation is being fostered. Co-operation will do more to simplify what was a complex situation than any other one factor.

"As the solution of local motor vehicle transportation approaches, the extension of the business into distant territory brings for settlement interstate problems. Again, the many conflicting and different interests suggest as many plans for solution as there are interests. Of course the only legislative body which can enact laws or provide regulation for interstate traffic is the federal Congress, as this right is denied the states by the Constitution of the United States.

"Whether Congress should enter the field of motor vehicle regulation, and if so the nature and extent of such regulation, is now one of the absorbing questions. At our convention last year at Washington we adopted a form of federal regulation and indorsed a tentative bill prepared by our general solicitor, Mr. Benton, and a committee that had been appointed for that purpose. The bill was introduced in the Senate as Senate Bill No. 1734, referred to the Senate committee on interstate commerce, and that committee

Resolution presented by

Mr. Gettle of Wisconsin before the

National Association of Railroad and Utilities Commissioners

Asheville, N. C., Nov. 9-12, 1926

Whereas, at the Annual Meeting of this Association held at Detroit in 1922, this Association adopted the following Resolution:

Now Therefore, Resolved, that it is the sense of the National Association of Railroad and Utilities Commissioners that the principle of the indeterminate permit is economic, sound and should be adopted in the legislation of the various states relating to public utilities, and

Resolved Further, that this Association do and it does hereby urge the legislatures of the various states which have not yet adopted the principle of the indeterminate permit to enact legislation recognizing and putting such principles into effect.

Therefore Be It Resolved, that this Association renew its recommendation for the establishment of provisions authorizing the "indeterminate permit," and that we recommend that provision be made therefor in the proposed uniform law now under consideration by the National Conference of Commissioners on Uniform State laws; and be it further

Resolved, that a copy of this resolution be transmitted to said conference.

held hearings on said bill covering a period of several days. Much concern was manifested by many different interests and numerous views expressed and several amendments offered. In fact, before the hearings were concluded some one had made objection and offered amendments to at least every important part of the bill, and some truck organizations objected strenuously to any legislation at all on the subject. The bill has never been reported out of the committee.

INVESTIGATION BY INTERSTATE COMMERCE COMMISSION

"Much interest has attached to the recent order of the Interstate Commerce Commission initiating a country-wide investigation of interstate motor vehicle transportation. Those who have followed the hearings in the various cities throughout the United States are aware that it is quite clearly developed that all are not of one accord on the question of federal regulation, but the prevailing sentiment disclosed by a preponderance of the evidence was for such regulation; it was also disclosed that the new transportation had made inroads on the revenues of steam roads in various parts of the country, and that steam and electric carriers in order to recoup their losses have taken over motor lines so as to control much of this transportation, and are operating them in conjunction with and as a part of their entire system, adjusting rates and fares and providing transfers and joint hauls to make the business attractive, convenient and lucrative, and are handling it with a fair degree of success. The hearings also developed that the most profitable lines are those giving service not reached by other established modes of transportation. In other words the records of the hearings seem to indicate that motor transportation will find its place; not in competition with steam and electric, but to supply a service not reached by either, and in co-operation with both.

"Experience has shown that motor transportation is not cheaper than steam and electric as first supposed, but on the contrary, more expensive; however, its lack of delay, flexibility and convenience of the service overcomes its expensive operation and serves to create and retain a demand for this kind of service.

"The history of the business up to the present time shows conclusively the need of public business regulation and also clearly demonstrates that for the business itself and the people who use it local regulation has been a success. Great care, sagacious thought, and sound judgment should be experienced in federal regulation lest this important industry be seriously crippled or handicapped. Such regulation, we maintain, must be made on the basis that motor vehicle transportation is primarily a local question, and only incidentally an interstate one. Its hauls are necessarily short hauls, and even a large per cent of its interstate operation is made up of transporting persons or property from the near border in one state just over the line in the adjoining state; in this respect its operations are not comparable with railroads and express companies which

transport through several states or across the continent—so that the local aspect of the industry should not be forgotten in any regulation.

"Those living in a particular community are better acquainted with their transportation needs than those residing at a great distance. And another important consideration which must be kept constantly in mind is, that the states furnish the highways, the necessary instrumentalities which make the industry possible; each state, therefore, has something to say as to the nature of transportation on its highways; the width and weight of the vehicles used; the rate of speed they should travel; road regulations in the interest of safety; these and many more, are all local questions peculiarly within the jurisdiction of the states, and legislation on the subject to be not only just, but valid, must reckon with them.

"A splendid discussion of motor freight problems is found in the testimony of Thomas Snyder, secretary-treasurer of the Indiana Transfer and

CASUALTIES IN HIGHWAY GRADE- CROSSING ACCIDENTS IN UNITED STATES AND AUTOMOBILES REGISTERED

Year ended	Persons Killed	Persons Injured	Automobiles Registered (000)
Dec. 31, 1916...	1,652	3,859	4,983
1917...	1,969	4,764	6,147
1918...	1,852	4,683	7,565
1919...	1,784	4,616	9,232
1920...	1,791	5,077	10,466
1921...	1,705	4,868	12,238
1922...	1,890	5,383	15,092
1923...	2,268	6,314	17,592
1924...	2,149	6,525	19,954
1925...	2,206	6,555	

Warehouse Association, before the Interstate Commerce Commission at a hearing in Chicago; the suggestions are so pertinent and so well stated that we have made them an exhibit to this report so as to bring the same before the association.

"From a study of the motor vehicle industry, its local nature and character of its business, we do not believe it wise or prudent to place its regulation under the Interstate Commerce Commission. We, therefore, recommend that the passage of Senate Bill No. 1734, with such amendments as may be found necessary, be urged by this association."

A most constructive view regarding the relative importance of service and rate of fare for local transportation companies is expressed in the report of the committee on service of public utility companies. That part of the report dealing with this subject is printed below:

"The standards of service of street car companies are fairly well stabilized as is shown by the few new rules or changes in rules that have appeared in the past few years. The biggest service problem before the industry at the present time is that of modernizing its equipment. Cars which are more comfortable, more speedy and less noisy than ever before are being built, and with light weight and one-man operation they are frequently more economical to operate than the older types. The commissions can and should co-operate with the street car companies in this movement, because it is generally agreed that today good service

is more important in street car regulation than cheap fares.

"Great improvement has been made in the last few years in the type of bus operating in this country, and this improvement continues to progress with rapidity. As the bus approaches in appearance the private limousine, the public demands an even greater reduction in noise and unpleasant odors due to gasoline and oil. Improvement in these lines together with increased attractiveness both within and without bring their own reward in increased revenues. Competition is still keen enough so that it is necessary only for the commission to encourage, without, except in rare cases, demanding continued progress.

"One decided advance recently made in service of local transportation is the de luxe or parlor car bus line running parallel with and controlled by the street car line. The characteristics of such operation are luxuriant buses, a high rate of fare, usually 25 cents, high speed and efficient and courteous service. Such a line has been established within the past year between Chevy Chase, a suburb of Washington, but within the District of Columbia, and the downtown section including the Union Station and the Capitol. Not only has this line made money, but also, according to the president of the Capital Traction Company, which operates it, it has been one of the best good will builders the company has found and apparently has actually helped increase the number of passengers on the car line. The local utilities commission gave permission to the car company to run this line parallel to its own tracks at a 25-cent fare, notwithstanding the fact that the then independent bus company petitioned for permission to operate a bus line at 10 cents. The commission was led to this decision partly because of the question of competition, but largely because it was felt that the type of service desired demanded a high rate of fare. As strange as it may seem, the citizens of Chevy Chase through their Citizens' Association threw the weight of their support to the higher fare."

Recommendations of the National Conference on Street and Highway Safety for the protection of dangerous grade crossings are indorsed by the committee on safety of railroad operation. Experience with a law of this type in the state of Minnesota is cited by the committee. That portion of the report on this subject follows:

"The Minnesota grade crossing law has now been in operation for about one year. This law authorizes the Railroad and Warehouse Commission to designate particularly dangerous crossings as 'stop' crossings, and requires all drivers to come to a full stop at such crossings under penalty.

"The commission has exercised great care in the selection of the crossings to be so designated, and only about 10 per cent of the crossings in the state are so marked.

"The enforcement of the law is in the hands of the local authorities, and results vary depending upon their activities. The placing of the signs and the publicity given them has accomplished great good, as the drivers who do not actually come to a dead stop, no

doubt do look and proceed over the crossing more carefully. This is shown by the reduction in the number of accidents, although the number of cars in use has greatly increased.

"The adoption by all states of a uniform law empowering the commissions to designate dangerous grade crossings at which drivers of automobiles and other vehicles must stop, as recommended by the National Conference on Street and Highway Safety, is highly desirable and should have the active support of this association.

"In Minnesota the State Highway Commission, in connection with its road-building program, is very active in the rerouting of the trunk highways in a manner so as to eliminate all grade crossings that it is possible to do away with. In such work it is meeting with much co-operation from the railroads, and where crossings are necessary the railroad and the commission are eliminating the grade crossing by the construction of overhead or underground crossings and sharing in the expense of such improvement. When the State Highway Commission took over the trunk highway system in Minnesota in November, 1920, there were approximately 932 grade crossings to be contended with

in connection with the 7,000-mile trunk highway project. The highway department, by the end of the year 1926, expects to have eliminated 357 of this number. Of the 357 eliminated, 44 will have been by overhead structures, 80 by underpasses and 233 by relocation of the highways. Further crossings will be eliminated by one or the other of the above methods as the trunk highway projects are further extended. The policy of the State Highway Commission is one to be commended, and the good work has no doubt already saved the lives of many of our own citizens and citizens of other states.

"In connection with the operation of the new Minnesota grade crossing stop law, the city of Minneapolis and various other municipalities have passed ordinances requiring all motor vehicles to come to a full stop at all railroad grade crossings within their municipal limits, which have been designated stop crossings by the Minnesota commission under the provisions of the new law. The municipalities have the necessary traffic officers to enforce the law, and their ordinances will no doubt be quite rigidly enforced. The effect of such enforcement will be far reaching in commanding respect for and obedience of the stop crossing law."

Regulation and Snow Fighting Discussed at Wisconsin Bus Meeting

STATE regulation of bus lines and the part bus companies should play in snow removal activities were the two most vital questions discussed by members of the Wisconsin Motor Coach Association at its first annual convention, held in Madison, Nov. 9 and 10. The organization includes several electric railways operating buses.

The association sponsored a bill for regulation of bus lines at the last session of the Legislature. It was passed by both houses, but was vetoed by Governor Blaine. The association plans to present a new bill at the next session.

C. N. Mauer, state traffic engineer with the Highway Commission, addressed the convention on traffic regulation from the highway official's viewpoint.

The two-day convention was arranged by M. H. Frank, Wisconsin Power & Light Company, Fond du Lac, president; John M. Cadby, newly appointed secretary of the association, and E. R. Fitzgerald, Royal Rapid Transit Company, treasurer.

The list of speakers included Mayor A. G. Schmedeman, Madison; L. C. Knapp, Wisconsin Power & Light Company, Manitowoc; President Frank; Edgar F. Zelle, president Minnesota Motor Bus Association, St. Paul; Chester Moore, vice-president and secretary Illinois Motor Transportation Association; B. W. Arnold, Chicago, North Shore & Milwaukee Railroad; Dudley Montgomery, Madison Railways; Francis A. Cannon, Madison, secretary Wisconsin Good Roads Association; C. M. Larson, Madison, secretary Wisconsin Railroad Commission; Prof. W. C. Hewitt, Oshkosh Normal School; J. F. O'Neill, Madison, Wisconsin Motor Bus Lines; H. J. Underwood, Vacuum Oil Company; Mr. Fitzgerald; A. E. Clock,

Chicago, North Shore & Milwaukee Railroad; Mr. Maurer; H. G. Monger, Milwaukee, Wisconsin Motor Bus Lines, and Edwin E. Witte, Madison, chief of the legislative reference library.

Officers of the association, who hold over until February, include Mr. Frank, president; Mr. Monger, first vice-president; Mr. Knapp, second vice-president, and Mr. Fitzgerald, treasurer. Directors include the above officers and B. W. Arnold, A. M. Schrum, Gray Transportation Company, Menominee, Mich., and A. E. Beaurline, Twin City & Southern Bus Company, St. Paul.

President Frank, in his opening address, advocated greater use of newspaper advertising space, of coupon mileage books good for transportation on any bus line connected with the association, group insurance for member companies, adoption of standard classification of accounts in order to make studies and comparisons of costs, and uniform methods for selection of drivers.

C. M. Larson, chief engineer of the Wisconsin Railroad Commission, said that if buses are to play a permanent part in the nation's transportation business, they must maintain service schedules during the entire year. He warned bus operators that if service is discontinued for several days or weeks at a time because of the expense of snow removal, bus operation is sure to lose some of its popularity.

A traffic regulation policy was outlined by J. T. Donaghey, chief engineer Wisconsin Highway Commission. This program included uniformity throughout the nation in both highway traffic laws and city ordinances governing traffic, education of motor vehicle operators in traffic laws and regulations, and acceleration of traffic on heavily

traveled highways rather than retardation of it. This could be accomplished, he declared, by educating the slow, reckless driver as well as the fast, reckless driver. Mr. Donaghey prophesied that the time would come when there would be no maximum speed limit and the only cause for arrest will be reckless driving.

An outline of the maintenance methods of the Wisconsin Motor Bus Lines was presented by H. L. Debbink, superintendent of gasoline vehicles for the Milwaukee Electric Railway & Light Company.

Internationaler Strassenbahn und Kleinbahn Verein to Meet

ON THE invitation of the Copenhagen Street Railway System, the 1927 convention of the Internationaler Strassenbahn und Kleinbahn Verein will be held in Copenhagen, Denmark, on June 20 to 23. Business sessions will be held during the mornings of those days. The afternoons will be devoted to visits to various points of interest in and about the city.

A tentative list of some of the topics to be discussed follows: Improvements in Copenhagen rolling stock, particularly in the direction of methods of brake control and car painting; reduction in the maintenance-of-way expenses of the Copenhagen system through the application of the sorbitic process to rails; radio disturbances; the motor bus and the street railway; practical methods of increasing average schedule speed; simplified methods of exchange of freight between trunk lines and electric railways; general statistics.

American Association News

Coffin Award Committee Meets

PRELIMINARY plans for the Charles A. Coffin Prize competition in 1927 were made by the Coffin award committee at a meeting held at association headquarters in New York on Nov. 17. Letters to electric railway companies inviting participation and announcing the conditions of the 1927 competition are to be prepared and distributed at an early date. The committee felt that the Coffin award has been a large factor in stimulating enthusiasm and progress in the industry and that the advantages to be obtained by participation make it important that the preparation of briefs be started early in the year. For that reason it was considered desirable to announce the conditions for this year's competition as early as possible, and steps were taken to carry out this objective.

The committee also recommended publication of a 1926 issue of "Electric Railway Practices," this being a digest in book form of the developments by the various contestants, similar to that published in previous years. Those present at the meeting were President W. H. Sawyer, W. W. Trench, secretary Charles A. Coffin Foundation, and James H. McGraw.

The News of the Industry

\$15,000,000 Railroad Extension

Preliminary Plans Completed for the Proposed New Line to Cover the Industrial Belt of Piedmont.

Interest in the territory that will be affected centers in the talk of the extension of the Piedmont & Northern Railway from Charlotte to Durham, a distance of 150 miles, and from Gastonia to Spartanburg, S. C., a distance of 50 miles, making a total new trackage of more than 200 miles. The construction of the proposed new lines will involve an expenditure of about \$15,000,000, but officials of the railway have declined to discuss the question of estimated costs.

Officers and directors of the railway have committed themselves by formal resolution to the early construction of the line to make a continuous route from Greenwood, S. C., to Durham, in accordance with the intention of the late James B. Duke and associates, at the time they organized the railway fifteen years ago. The extension of the North Carolina portion of the railroad will, in effect, give Charlotte and other towns touched a new trunk line railroad and bring the Atlantic Coast Line and the Pennsylvania Railroad into Charlotte by reason of the physical connections tapping these systems.

The intention of Mr. Duke and his associates at the time they organized the company is recalled in the first paragraph of the preamble to the resolutions adopted by the directors. It is stated that the company originally "intended that its main line of railway should extend through the Piedmont sections of the Carolinas from Greenwood, S. C., to Durham, N. C., with such additional lines as might be necessary or desirable for the development of the resources of this section."

MEETING SCHEDULED FOR DEC. 8

The resolutions state that the "preliminary plans" looking to the resumption of construction "have now been completed to the point where further construction work may be commenced." The resolutions adopted by the board of directors contain a call for a meeting of the stockholders to be held in Greensboro, S. C., on Dec. 8 to consider and pass upon the proposal of the board that the work of extension of the lines, as described by the board, be resumed. It is assumed that securing the assent of the stockholders to the program is a mere formality and that the program will be promptly approved by them and that shortly thereafter contracts for portions of the actual construction may be awarded.

The resolutions adopted do not mention a city or town to be touched between Charlotte and Durham and no

further information on this point could be obtained from officials of the company. It is being recalled, however, that a campaign was waged by public-spirited citizens last year in Winston-Salem and other towns between there and Charlotte with a view to securing promises of business support for the extension, which at that time was generally described as to be from Charlotte to Winston-Salem. Nothing is known outside of Piedmont & Northern official circles as to just what route the proposed extension will take between Charlotte and Durham, but it is thought likely that it may touch one or two if not all of the "triangle" cities—Greensboro, Winston-Salem and High Point.

The proposed new line will traverse the great industrial belt of Piedmont along the line of what has been called "the workbench of the South." Like the portions of the Piedmont & Northern already constructed, the new lines will be electric, operated by power produced by the Southern Power Com-

pany, the major Duke enterprise of the section.

At Durham the Piedmont & Northern, when completed, will connect with the Norfolk & Western and with another Duke railroad, the Durham & Southern, which extends from Durham to Dunn, on the main line of the Atlantic Coast Line.

Fare Advance Sought in Los Angeles

The Los Angeles Railway, Los Angeles, Cal., has filed with the California Railroad Commission an application asking the commission to investigate its operations and its rates and to establish a new rate structure based on a 7-cent single fare with four tickets or tokens for 25 cents, including free transfer privileges. The company states that it is no longer able to operate on the present 5-cent fare and that for the last two years its railway service has been carried on at a loss. No dividend has been paid since 1913.

Illinois Inquiry Under Way

Bankers Favor State Control and the Terminable Permit at Legislative Committee Hearing—H. R. Riley Severe in His Criticism of Lisman Proposal—Receivership Talk Revived

STATE supervision of traction properties, as against local regulation, and the adoption of terminable permits are recommended by the nine Chicago bankers and industrialists who have so far appeared before the joint committee of the Illinois Senate and House appointed at the last session of the General Assembly to consider these problems. The committee opened hearings in Chicago on Nov. 8.

John J. Mitchell, chairman of the board of the Illinois Merchants Trust Company and the first witness to be called, stated that the twenty-year franchise by which Illinois companies are now limited by law is entirely too short a grant to permit effective financing. He said that people who have studied the question thoroughly consider an indeterminate franchise the most economical, satisfactory and up-to-date method of dealing with the subject. He was convinced that "there is a decided advantage in having utilities controlled and supervised by a state board. I believe such a board is better fitted, more disinterested and less tainted with politics."

George M. Reynolds, chairman of the Continental & Commercial National Bank, believed an indeterminate permit with proper safeguards would be helpful in raising the large sums necessary. He said that to avoid local politics members of a commission to control Chicago's local transportation

agencies should be appointed by the Governor rather than being elected or appointed by the mayor.

With regard to the expiration of Chicago Surface Lines franchises and the maturing of some \$150,000,000 of bonds on Feb. 1, Mr. Reynolds held that receivership was all but inevitable. He favored immediate construction of downtown subways, but pointed out certain disadvantages in the special assessment method of payment.

THIRD WITNESS OUTLINES IMPORTANT POINTS IN FRANCHISE QUESTION

Three things must be considered in the local franchise question, according to George T. Woodruff, president of the National Bank of the Republic, and the third witness. The first item he mentioned was statewide regulation of utilities; second, the renewal of the danger of local prejudice interfering with fair rate making and, third, that these two would result in larger units of operation safe for small investors.

Ralph Van Vechten, president of the State Bank of Chicago, said that rates, service and financing are the only questions to be considered. He predicted that any effort to refinance the Chicago Surface Lines on the present basis would be very difficult. Receiverships had been tremendously expensive and naturally the bondholders were gun shy.

Other bankers and business men went

on record for terminable permits and state control.

H. B. Riley, president of the Chicago Title & Trust Company, trustee for holders of the underlying securities of the Chicago Surface Lines, said he did not look for a receivership of the Chicago City Railway, but there seemed to be no hope of the Chicago Railways escaping this fate. He declared that the twenty-year ordinance of 1907 was excellently conceived in many respects, but the sponsors unfortunately could not look into the future and see that financial conditions would change. With the purchasing value of the dollar at only 65 cents, a 7-cent fare was not quite enough to take up the slack.

Much interest was taken in Mr. Riley's outspoken remarks about the recent proposal of the Lisman interests to take over the Surface Lines properties. He said in part:

I don't believe that Lisman can put it over. He has the reputation in New York of being without a peer in railroad reorganization. But we have a different situation here. Our railway is not in such straits. It is a going concern, in continuous operation, paying its way. All it is asking is permission to go ahead under fair conditions.

Mr. Lisman's proposition is to put in \$50,000,000 cash for the purchase of a \$165,000,000 property, when the contract with the city under the 1907 ordinance provides if the city buys the property it must pay cash for it. I don't think Mr. Lisman could get \$165,000,000 cash, but, of course, if you were going to turn over these properties to him for \$50,000,000 cash and the rest paper, he could walk down Wall Street and put it over in 24 hours. In my opinion the city will have to give the companies a license to continue operation when their franchises expire, either a franchise or just a permit. The city must do that or people couldn't get to their work.

Chicago must stop getting people to put up money for its transportation service and then taking their property away from them.

Fear was expressed at a meeting of the local transportation committee of the City Council on Nov. 11 that the terminal permit investigation committee would be unduly prejudiced in its report to the Legislature by the sentiments of local bankers, who, almost to a man, are in favor of state control of public utilities.

Alderman Joseph McDonough, chairman of the committee, declared that some of the bankers who testified have sought to convey the impression to the legislators that there is a divided sentiment in Chicago for and against "home rule."

The Alderman said that on the contrary the investigating commission should be told that there is an overwhelming sentiment in favor of local supervision and control. He said that "a referendum on 'home rule' would soon convince them what percentage is for, and what against it."

The local transportation committee is almost unanimously agreed that Chicago voters would not countenance any other arrangement than home rule in a new traction ordinance, but the majority of its members have gone on record as favoring the terminable permit.

Mayor William E. Dever, Corporation Counsel Francis Busch and several Aldermen are to appear before the investigating committee in support of local regulation at its next session on Nov. 26.

Detroit Appointment Expected Soon

Mayor Smith of Detroit and the Street Railway Commission will meet on Nov. 30 to appoint a successor to Col. H. U. Wallace, manager of the municipal railway. Del A. Smith has been mentioned for the appointment, but no definite action will be taken until the Mayor returns to Detroit. Colonel Wallace tendered his resignation as general manager to become effective on Jan. 1. Press of private business including management of his 5,000-acre plantation in Georgia is his reason for resigning. There has been no dissension on the part of the general manager or the city administration during the term of his employment. Del Smith's salary has recently been raised from \$7,000 to \$9,000 a year.

It was in June a year ago that Colonel Wallace succeeded Ross Schram in charge of Detroit's municipal railway. He was selected for the post from a long list of candidates after Mr. Schram had been dismissed from office by Mayor Smith for "inexperience and inefficiency and for neglect to furnish me with reports which I have repeatedly requested." Counter accusations by Mr. Schram received short shrift.

City Officials at Odds Over "L" Lease Renewal

An array of facts and figures was presented on Nov. 18 to the Public Service Commission of Pennsylvania at the second hearing on the position of the city of Philadelphia and the Philadelphia Rapid Transit Company for approval of the 30-year extension of the Frankford Elevated lease.

The hearing was preceded by a controversy in the press between City Solicitor Gaffney and City Controller Hadley, the latter calling the amended lease "unnecessarily unfair" and pointing out that, on July 1, 1957, when the proposed 30-year lease would expire, the P.R.T. would owe the city \$3,706,000. He offered a substitute amendment in which the payments in the last ten years are increased each year by an amount that will make up the \$3,706,000. In this way, he declared, the city will actually have the excess due from the P.R.T. at the end of 1957.

Controller Hadley also maintained that the Frankford "L" is not unprofitable as the P.R.T. claims and declared that his "audits for 1923 and 1924 show the receipts were \$2,031,534 and the direct expenses in the same years were \$317,671."

Thereupon, City Solicitor Gaffney took issue with Mr. Hadley's pronouncement that the lease was "unnecessarily unfair," accepted his analysis of the proposed P.R.T. return and then pointed out that the aggregate, if correctly applied, meant \$635,000 more to the city than would be due if the present rental scale was continued until 1957. He maintained that Mr. Hadley's substitute amendment would be unfair to the P.R.T. in that the company was entitled to use the money during the final ten-year period.

Mr. Hadley's attack on the amended

lease, regarded in the city hall as a blow at the administration's plan speedily to execute the new lease so that borrowing capacity tied up in elevated bonds could be released, prompted Mayor Kendrick to declare that "Mr. Hadley's statement came as a surprise" to him and that he stood "solidly behind City Solicitor Gaffney and his legal advice."

Thus matters stood on the eve of the second Public Service Commission hearing.

Reference to the first hearing appeared in *ELECTRIC RAILWAY JOURNAL*, Nov. 6, 1926, page 858.

Interstate Free of Clause Limiting Profit to Fair Amount

The Interstate Public Service Company, operating an interurban electric railway from Louisville, Ky., to Indianapolis, Ind., was held not to be subject to the provisions of Section 15a of the interstate commerce act in a decision issued by the Interstate Commerce Commission on Nov. 16.

Section 15a provides that rates of railroads shall be made so as to produce "as nearly as may be" a specified percentage on fair return, on investment, and also provides for the recapture of half of any excess above 6 per cent.

The commission found that the interurban is an interurban electric railway not operated as a part of a general steam railroad system of transportation and not engaged in the general transportation of freight within the meaning of paragraph 1 of section 15a of the interstate commerce act; and that the respondent, in the operation of the interurban, is not a carrier within the meaning of that section and is not subject to the provisions thereof.

The opinion of the commission was that the interurban is not engaged in such general transportation of freight as to cause it to resemble steam roads in the performance of that function. Further the commission said that the differences between the freight service performed by it and that performed by steam roads generally are so great as to show that it does not belong to their class.

According to the commission the road has a larger share of interstate business than most interurban electric roads on account of its terminals being in different states, but the commission said that does not change the character of its operation. It also has greater facilities for and handles a larger percentage of freight than most interurban electric roads, but its characteristics in general are the same as those of most other interurban electrics, while the nature of its freight traffic, the character of its road and equipment, and its inability to interchange equipment with steam roads or to make through shipments in connection with them except to a very limited extent, its different scale of wages and its different passenger fares all distinguish it from steam roads and show that it is not to be grouped with the steam railroad system, for which, in the commission's view, section 15a was primarily intended.

Committee Appointed to Draw Jacksonville Franchise

The City Council of Jacksonville, Fla., on Nov. 4 appointed a citizens' committee to aid the laws and rules committee of the legislative body to prepare a franchise for the Jacksonville Traction Company.

The meeting at which the committee was appointed was the last of the public hearings to permit those interested in the proposed 30-year franchise for the company to state their case. No one took the floor against the franchise. The meeting was of short duration and adjourned after the citizens committee was appointed. About 40 persons attended the meeting.

The citizens' committee will call upon the laws and rules committee only when it needs advice. The recent discussion incident to the consideration of the matter of a new franchise for the railway was reviewed in the *ELECTRIC RAILWAY JOURNAL* for Nov. 13, page 901.

New Operating Deal in Norfolk

A revision of the public transportation system of Norfolk, Va., has been worked out by the city manager, the Norfolk Railway & Light Company and the business men of that city, all co-operating.

The plan eliminates a zone system of fares, changes, routings and co-ordinates services of all street cars and buses. It fixes the fare at three tokens for 25 cents or 10 cents cash, with school tickets in books of 24 for \$1. It also includes a weekly pass entitling the bearer to ride over the system at will for \$1.50 a week.

An investment of \$1,000,000 of new money will be made by the transportation company to put the plan into effect. It will result in the replacement of property now in service to the amount of about \$750,000.

Under the new plan of fares, rerouting and co-ordination the average of the fare increase is estimated to be 7 mills. It is expected, however, that this will be sufficient to enable the company to earn a return on its property value and to supply public transportation acceptable to the community, by trolley cars and buses under a single management operating efficiently.

Berlin Plan Advocated for St. Louis

C. E. Smith, consulting engineer for the city of St. Louis, Mo., speaking before the St. Louis Railway Club on Nov. 12 advocated the adoption of a rapid transit system similar to that in Berlin as a means for relieving traffic congestion in St. Louis. He admitted that his proposal was still intangible, but suggested that the city buy a half block right-of-way from street to alley along a residential route and make it into a parkway with double-tracked electric lines in the center, either on elevated or depressed tracks. He estimated that it would cost \$1,000,000 a mile to build such a line compared with \$5,000,000 a mile to construct a subway.

Mr. Smith took issue with city planners who advocate limiting the height of buildings to ten stories. He said the use of this system would build up secondary congested districts which would be almost as bad as a central congested district and infinitely more annoying.

\$3,500,000 for Additions to San Francisco Municipal Railway

A special bond election to vote \$3,500,000 in bonds to finance construction of extensions to the San Francisco Municipal Railway, San Francisco, Cal., and provide more shops and other equipment is planned by the Board of Supervisors, following a recommendation by City Engineer M. M. O'Shaughnessy. The date of the special election will probably be set by the city officials in charge of the matter for early next spring.

Mr. O'Shaughnessy's report to the committee includes suggestions for a car repair shop, additional buses for connections, a garage to house the buses, the Sunset line through the Duboce tunnel, the Excelsior line through Bernal cut, an extension of the Church Street line; the Balboa line; Taraval extension to the municipal swimming pool and an extension into the Marina tract.

The projects involve a total expenditure of \$4,000,000, of which there has already been appropriated the sum of \$500,000 for track construction in the Sunset district.

The details of the program are:

Car repair shops at Seventeenth and Hampshire Streets.....	\$ 250,000
Motor buses	150,000
Garage	60,000
Marina tract line—Connecting new residential section from end of Chestnut Street line....	94,000
Sunset line—Connecting down town district with beach via Duboce tunnel and Judah Street (\$500,000 already appropriated for this line).....	1,602,000
Excelsior line—Extension of Church Street line via Bernal cut, across Mission Street to Excelsior district	1,245,000
Balboa line—Connecting with Geary Street line at Masonic Avenue to Turk Street, thence west to 33d Avenue via Balboa Street	540,000
Taraval extension—To municipal swimming pool	150,000

Hitting the Nail on the Head

Tommy was asked by the teacher to write an essay on safety. It was a very good essay, indeed, and one sentence we take the liberty of quoting. Says Tommy:

"One of the many advantages of crossing crossings carefully is that you get to the other side."

We have been for five years or more teaching safety and preaching safety, and all we have said could be boiled down to Tommy's one sentence.

"To get to the other side." Traffic regulations were not made to keep policemen busy. They were made to protect you. If every one would look at them in that light they would not need any boosting.

—Ottawa Electric Railway News.

Petitions Filed Calling for Kansas City Franchise Vote

Referendum petitions calling for a vote of the people on the twelve-year railways franchise extension ordinance in favor of the Kansas City Public Service Company, Kansas City, Mo., have been filed with the city clerk. Operation of the ordinance automatically is held up by the filing until the matter is voted on by the people or the ordinance is repealed by the Council.

The petitions demand that the Council call a special election. The Council vote on the call for a special election would have to be by two-thirds vote and the expense of the election would be borne by the railway.

If no special election is called the matter would go over to the next city or general election. There will be no city election until April, 1930, and no general election until November, 1928.

The ordinance which it is now proposed to submit to the public for approval would extend the present railway franchise twelve years, making the grant one of 30 years duration.

Negotiations for a new franchise now are before the Council.

Sunday Passes Prove Popular in Cincinnati

It is understood that the Cincinnati Street Railway, Cincinnati, Ohio, is well pleased with the first day's showing with the Sunday pass. A total of 7,000 25-cent passes were sold on Nov. 13, when the plan was formerly put into operation. The passes are good on any of the lines operated in Cincinnati. They are sold by the conductors and are good from 6 a.m. to midnight Sunday. The passes are not accepted on the motor coaches operated by the railway. The plan is identical with that adopted by the Pittsburgh Railways some time ago.

London, Ont., to Vote on Railway Settlement

Operation of the London Street Railway, London, Ont., by the city may be in prospect. At any rate, the City Council of London, at a special session on Nov. 5, concluded negotiations with the company to provide for a plebiscite at the municipal election to be held on Dec. 6 on two alternative propositions, namely:

1. Purchase of the system in its present condition at a price of \$1,185,351.
2. Extension of the company's franchise, granting it exclusive right for cars and buses.

On the first of these proposals only the ratepayers will vote. On the second proposition, however, all municipal voters will be entitled to pass on the issue.

The franchise extension scheme, if approved by the people, will provide for a 5-cent fare for the first two years from March 1, 1927, after which period the company will be entitled to appeal to the Council if more is required to earn a 6 per cent return on the present capital stock of \$637,480. If in the future the city desires to purchase the

property, six months notice may be given and the price fixed at the valuation now agreed upon, plus the cost of improvements, and minus depreciation. All capital expenditures must be approved by the city. If the company at any time suspends operations for a day, the City Council may authorize

buses. The company property is to be exempt from all except school taxes. Real estate only shall be fully taxed. One-man cars will be operated when permitted by the City Council. The company has obligated itself to spend \$500,000 on improvements over a three-year period.

Each Branch of Service Must Pay Its Way

Commission So Rules in Elmira Case, Although the Profit on Electric Division Exceeds Railway Deficit—If Railway Is Not Patronized More Liberally Newer Means of Travel Will Supersede It

THE Public Service Commission of New York decided on Nov. 15 the complaints made by the Mayor of Elmira against rates charged by the Elmira Water, Light & Railroad Company for gas and electricity and for street car fares.

Complaint against the gas rates is dismissed, the commission in the prevailing opinion finding that on a rate base established of \$1,521,481 there is a return on the property used in giving gas service of 7.9 per cent. This return the commission finds reasonable.

The commission denies the petition of the city asking for an immediate reduction of the electric rates pending a study of certain optional rates filed by the company on April 8 and July 20 last. The company is directed to make a study of the results of these rates and submit it to the commission on or before Feb. 1, 1927, for its consideration with suggestions as to further adjustments of its electric rates, decision on these rates being reserved.

MEMORANDUM ON FARES

The commission holds that any change in fares should be held in abeyance until the final settlement of the electric rates after filing results of the study in the electrical department.

The majority memorandum of the commission was by Commissioner Van Namee, Chairman Prendergast and Commissioner Pooley concurring. After a detailed examination of the three departments of the company the memorandum says on fares:

The number of fares on the car lines as shown in the annual report of the Elmira company is as follows: 1924, 6,572,189; 1925, 6,391,609; a decrease of 180,580. This figure is a decrease of approximately 2.75 per cent, and includes the results for seven months of the increase of fare in the city of Elmira from 6 to 7 cents.

It is fair to assume that any increase now made would result in at least a 5 per cent decrease in passenger fares. The net deficiency of return as shown by the compilations is approximately \$143,000. It is evident that any fare which could possibly be collected on the railroad would not make up this deficiency of return. The point is soon reached where the falling off in riders more than offsets the increase in fare. The commission believes that the highest rate of fare that is practicable in the city is a combination of token and straight fare of 10 cents. Deducting the 5 per cent, we assume that the number of revenue passengers will be approximately 6,100,000. If the company is given a straight increase from 7 to 9 cents on 6,100,000 riders, the 1925 revenue would be increased \$112,456. Under a straight 10-cent fare the increase would be \$173,456.

Under the peculiar conditions existing in the city, the commission is of the opinion that any change in the fare should be held in abeyance until the final settlement of the rates of the electrical department after the filing of the results of the optional rates in that department on Feb. 1, 1927.

The majority memorandum by Commissioner Van Namee further says:

The company contends that the Public Service Commission should view each public utility in the light of its peculiar situation in its particular community. If the convenience and welfare of the community are to be maintained by the commission only by consideration of the service utilities as a single entity, the commission has no higher duty than to effectuate such an arrangement.

The circumstances in the case of the Elmira company are such that the consideration of the electric, gas and railroad utilities for rate-making purposes as separate companies might be to deprive the community of the railway. The city, in its briefs, concedes that the railway, by any valuation, does not earn a fair return. The patronage of the railway has been decreasing for a number of years, and there is a very definite point at which the loss of passengers will offset the increase in revenue derived from an increased fare.

It is probable that a 10-cent fare would be the most the traffic would stand. Any higher rate than that would cause a loss in revenue, and even that fare will not give a reasonable return upon any value which could be placed on the railway property. If the revenues should be pooled, the losses of the railway would be approximately equal to the excess profits of the electrical department, thus enabling the company to maintain a utility which is essential to the welfare of the city.

The city takes the position that each of the three utilities must stand upon its own feet and that it is unfair to the consumers of one utility to make them pay the losses sustained by another utility of which they may or may not be customers.

The commission has heretofore held in matters connected with the city of Elmira that the above proposition was correct.

If the citizens of Elmira do not by their patronage of the street railroad allow the utility to obtain a fair return upon the money invested we know of no way to compel them to do so, and if such situation continues, the utility will have to suffer the fate of other transportation companies which have been superseded by newer, more convenient and popular means of travel.

We hold therefore, in this case, that each of these utilities must be considered separately, and to that end we proceed to an examination of the property of each, its operating revenues and expenses.

The memorandum fixes the rate base, present-day value, in the electrical department, at \$4,423,147, and says that after allowing operating expenses of \$862,238 and an 8 per cent return upon the present-day value depreciated of the property used and useful in the public service, the company received, as excess earnings in 1925, \$215,131. This figure of excess earnings is further adjustable because of the lower federal income tax payable under new rates. The allowable return of \$354,571 is determined by using the exact amount of the federal income tax as included in operating expenses for 1925 as estimated by the company, which amount appears reasonable. The taxes approximate \$60,000. The amount of this tax would be lower were the company only earning its allowable revenue and not in addition thereto its excess revenue of \$218,000. Under new rates, the company will not earn this excess revenue and so will not have to provide in its operating expense an amount to cover federal taxes on the same. This excess income tax we estimate at approximately \$25,000, and to the excess revenue of the company should be added this amount to show the total excess revenue for 1925. This makes such excess revenue approximately \$243,000.

The rate base, gas department, present-day value, is fixed at \$1,521,481. Operating revenues for 1925 are placed at \$487,566; total operating expenses, \$381,146; available for return, \$121,533, or 7.9 per cent.

The rate base railway department, Dec. 31, 1925, is fixed at \$2,251,689. The operating revenues were \$456,539 and the total operating expenses \$401,907, leaving \$54,632 available for return. On the rate base allowed the deficiency in return is \$125,501.

The memorandum says that a further adjustment of federal income taxes is necessary in its railroad department. The total deficiency of return in this department is approximately \$143,000.

Commissioner Van Voorhis, in dissenting from the majority memorandum, held that the three complaints should be determined at the same time and that consideration should be given to the various departments of the company as a whole in determining reasonable and just rates.

Commissioner Lunn concurs in the valuations found, but dissents on the ground that it appears that consideration is given only to reproduction cost new of the three properties. He was also of the opinion that determination of the matters should be held until Feb. 1, 1927.

More Moves in Springfield Modification Plan

By Jan. 1 it is expected all municipalities will have approved the proposed plan whereby the New York, New Haven & Hartford Railroad will control the Springfield Street Railway, Springfield, Mass. The City Council is going over the plan where it affects the city of Springfield. One of the important matters up for discussion concerns a preference between one-man and two-man cars.

President Clark V. Wood of the company has made it plain that this service with one-man cars is needed. One of the first steps in the rehabilitation of the Springfield lines will be the purchase of 50 new cars. The City Council is seeking to have them two-man cars.

Rerouting of lines to minimize rail traffic on Main Street is another feature of the rehabilitation plans. There is talk of having the Holyoke and Westfield lines terminate in a loop at Taylor Street. Other lines to be affected by rerouting include the Indian Orchard and Ludlow line and the Walnut Street and King Street line.

Fare Increase Likely on Florida Municipal Line

An increase in the fare from 5 to 7 cents is being considered by the committee on public utilities at St. Petersburg, Fla., to be charged by the local municipal railway.

According to the St. Petersburg Independent the chief reason assigned for the proposed increase, which also contemplates fixing the price of tokens at four for 25 cents, is that operating expenditures exceed those of last year, with the addition of the Shore Acres line and other improvements, while

receipts have fallen off and the budget allowance is insufficient to provide against any large decrease.

Director Ludwig, in charge of the railway, is reported to have said:

So far as I know it has not been definitely decided by the committee that an increased fare will be necessary. The bulk of tourist business is ahead of us, but if the decrease in receipts continues, some practical solution must be sought. If any change is made, it should be done before the beginning of the winter season. The fact must be faced that we cannot continue to make improvements out of operating expenses without showing a deficit on the budget allowance approved by the commission.

The decrease in receipts is directly traceable, it is said, to the falling off in real estate and building activities, and also to increasing automobile traffic.

The affairs of the railway were reviewed in an article in the *ELECTRIC RAILWAY JOURNAL* for Oct. 30, page 818.

Baltimore Busybodies Would Dictate to the Lord

The United Railways & Electric Company, Baltimore, Md., has notified the Maryland Public Service Commission that beginning Nov. 22 the skip-stop plan will be extended to include all lines during the morning and evening rush hours. The company has had the plan in operation on about ten lines during the last few months and reports that it has been decidedly successful. It is expected that the Public Service Commission will be called upon to hold a public hearing.

The announcement has stirred up considerable opposition and some organizations have asked the Maryland Public Service Commission to hold a hearing on the subject in order that their views can be expressed. However, one champion of the plan has not failed to let the commission know his views. He is Oregon Milton Dennis, one of Baltimore's leading lawyers. He sent this letter to the commission:

I believe we have the best railway system of any large city. My only criticism, however, was the frequent stops—at every corner. I have been riding almost daily on the Edmondson Avenue line (No. 4) for about twenty years. Since the skip-stop schedule was put into effect I get to Walbrook not only about seven minutes sooner, but the riding has been more pleasant.

There is a class of people who are always "against," and in many instances they are called "Improvement Associations." If the Lord came to Baltimore they would try to dictate to Him what side of the street He should walk on.

I believe the real busy people of Baltimore—the ones that contribute largely of their time to make it the great city that it is—are in favor of the proposed skip-stop schedule, and I hope your commission will give its sanction to it.

I am not a stockholder—directly or indirectly—in the United Railways.

Speedier Service for Wisconsin Interurbans

Patronage of the Milwaukee Electric Railway & Light Company's high-speed transit line placed in service this summer to connect Milwaukee with Waukesha and Watertown has again shown a substantial gain compared with the first month's operation. This is evidenced from the fact that during September, 1926, 66 per cent more persons used the line than during the similar month of last year.

Actual operation has established the

Punctilious Employees Honored

Sixty-one motormen, conductors and bus operators employed by the East St. Louis Railway, East St. Louis, Ill., recently were honored and awarded cash for cleanliness and neatness of their person and vehicles.

In accordance with a custom established several years ago by W. H. Sawyer, head of the East St. Louis system, a housewife of the city recently rode the cars and buses to check up on the crews. This was done surreptitiously as it was desired to obtain a cross-section of the actual every-day conditions on the cars.

On each car the housewife carefully noted the appearance of the conductor, whether his face and hands were clean and the condition of his collar, tie, suit, shoes, etc. Then she gave the car the once over, and finally the motorman came in for a similar checking. Her reports were sent personally to Mr. Sawyer and when finally every man employed in the city service had been investigated the list of those who had passed muster was revealed.

fact that high speed and frequent service, coupled with the use of the latest car equipment, make it possible for an interurban successfully to cope with the private auto and bus for transportation business. The company is now directing its attention toward adopting similar measures with its Milwaukee-Racine and Kenosha line. The running time here will be shortened almost a half hour when plans now under way are completed. This line will be so readjusted that the business districts of Cudahy and South Milwaukee will be avoided by a cut-off.

Special Safety Drive in Pittsburgh

Thirty men from the Pittsburgh Railways, Pittsburgh, Pa., 25 of them motormen and conductors, attended the National Safety Council convention, held in Detroit recently.

The men, all operators on the cars of the railway, sought to bring back to the 3,000 trainmen at home the message and methods of safety, in the hope of reducing the number of accidents.

Each man made a personal report, which will go to the carhouse or division he represents. The men were elected to the convention by their own associates on the cars.

The Philadelphia Company group, including the railways, Duquesne Light Company, Equitable Gas, Motor Coach and others, is taking part this month in a no-accident drive. There were also representatives of this group at the Detroit conference. In line with this move the railway decided several months ago that a series of stories and talks on safety by operators of cars would have the effect of decreasing the number of accidents and making the streets safer. Trainmen in the various carhouses were asked to co-operate and elect their own representatives.

Thomas Fitzgerald, vice-president of the railway; W. H. Boyce, commercial manager and chairman of the central safety committee; W. G. Marshall, personnel director, and J. M. Loftis, superintendent, represented the officials.

Banker Sees Chicago Situation as Possible Black Eye to Industry

F. J. Lisman, of F. J. Lisman & Company, New York, says whether or not his traction plan for Chicago is accepted a receivership for the surface railways there seems inevitable. Under his plan a receivership would be a formal matter, he thinks, and would not involve operation of the properties by a receiver. Regarding the Chicago traction situation Mr. Lisman says:

Contrary to general belief, the Chicago traction situation is far from being a local problem. Unless prompt and definite action is taken on the plan which has been submitted, certain default will occur in \$165,000,000 principal of bonds maturing on the first of February, next, and a default in interest on about \$70,000,000 bonds. If that is permitted to occur, the effects will be far-reaching and felt beyond the limits of the city of Chicago. Less than one-third of the entire amount of these traction securities is held in Chicago—the balance being in the hands of estates, insurance companies and individuals all over the United States. It is not at all unlikely that the broadcasting of the default on such a large amount of securities would have a depressing effect on traction bonds in general and tend further to weaken the confidence of the public in this type of securities. It is, therefore, evident that the problem is something more than the solution of a local traction situation.

The \$165,000,000 of bonds mature on Feb. 1 simultaneously with the expiration of the companies' twenty-year franchises which have not been extended. The existing companies are not asking for renewal because they claim they cannot do the financing necessary for the expansion of their system under a twenty-year franchise, and they are endeavoring now, as they have been doing for the last ten years, to get the Illinois Legislature to authorize a franchise for a longer period. In the meanwhile they are asking the bondholders to await the outcome of such legislation.

Under the franchise now about to expire, the city of Chicago has been receiving 55 per cent of the surplus earnings of the street railways and this method is to be continued. These surplus earnings which heretofore have been turned into the city traction fund, now amounting to \$45,000,000 and carrying a very low rate of interest, are hereafter to be used as a sinking fund to redeem the company's first mortgage 5 per cent bonds at par or below. Similarly, a renewal and depreciation fund, amounting to 8 per cent of the annual gross earnings, which has been allowed to accumulate during the last twenty years until it now amounts to \$21,500,000—all but \$5,000,000 of which is lying in Chicago banks at 3 per cent interest—is to be used hereafter in part for the purpose of redeeming the first mortgage bonds, to be issued for expansion.

Changes Suggested at Elizabeth Under Consideration

At a conference between officials of the Public Service Railway, Newark, N. J., and the Board of Works of Elizabeth, held on Nov. 12, Matthew R. Boylan Public Service vice-president, accepted for consideration two sets of resolutions, one prepared by the Board of Works and the other by the Civic Council on Transportation. It was recommended, among other things, that existing railway schedules be enforced rigidly and that bus lines paralleling the electric railway be rerouted. Back of the movement is a desire for single-fare transportation service to link all sections of the city.

Recent Bus Developments

Tax of 4½ Per Cent Approved in California

Amendment No. 2 on the November ballot in California proposing a 4½ per cent tax upon the earnings of stage companies was passed at the recent election. Specifically the 4½ per cent gross earnings tax is established in lieu of other taxes except the gasoline tax. Its effect will be to relieve the operator of a multiplicity of state and local imports and levies. It will, for instance, exempt the stages hereafter from weight and license taxes and permit them to operate under a public service license, as is the case with the motor vehicles operated by other public utilities.

The *Motor Carrier*, the official organ of the Motor Carriers' Association of California, says that the advocacy of the legislation by the carriers was based not on the hope of reducing taxes, but of substituting certainty and system for uncertainty and lack of system.

The amendment goes into effect as soon as the result of the election is certified by the Secretary of State.

Among the advocates of the measure was Harvey M. Toy, chairman of the State Highway Commission. He put the matter clearly in one of his speeches in part as follows:

This amendment will solve not only the problem of equitable taxation for the stage lines, but it will provide highway funds and put the stage lines on the same basis of tax relationship with the state as other public utilities. Two years ago I opposed a somewhat similar amendment proposing a 4 per cent tax on the earnings of the stage lines. My opposition then was based chiefly on the fact that the terms of that amendment provided the money derived should go to the general fund of the state instead of to the highway funds. The present amendment corrects that fault by requiring the use of stage taxes for highway purposes.

I am informed that the stage lines regard the tax of 4½ per cent as somewhat excessive, particularly in view of the fact that they will be subject to the state gasoline tax, the revenues from which likewise go to state highway purposes. But, considering all the factors involved, I do not believe that the rate in the amendment is too high. Further, it should be borne in mind that the State Railroad Commission fixes the fares charged by the stage lines, and if at any time in the future the tax rate should be found too high or too low, the way is left open for its adjustment by a two-thirds vote of the Legislature.

More Buses for Lincoln

The Lincoln Traction Company, Lincoln, Neb., has ten buses in service. A half dozen more are to be put in service by Dec. 15. Most of these will be used in the suburbs. Some of the buses are being used for peak-load periods with success. Severe parking restrictions are being made for the downtown districts, and their enforcement is expected to result in increased traffic for the buses.

The Omaha, Lincoln & Beatrice Railway has a full complement of buses running between University Place and Lincoln. A competitive service has just been installed by the Traction company.

The City Council has adopted the policy of full freedom of competition between the two railways for business in the downtown district, but is rigidly excluding all other forms of transportation for hire at rates comparable with those charged by the buses.

Columbia Case Unsettled

Jitneys, Buses and Trolleys All Still Furnishing Service in South Carolina Capital

The passenger transportation problem in Columbia, S. C., the capital of South Carolina, is still unsolved, but the three factors in the problem—the street cars, the 10-cent jitneys and the buses—are all in the field.

There is apparently no demand on the part of citizens for the restoration of railway service in sections recently abandoned by the Columbia Railway, Gas & Electric Company. That company is now operating only three trolley lines—these catering largely to the retail business district and the railroad station. Wires are up and the tracks in position in many other sections of the city, but no cars are being operated.

The bus line, however, is adding to its equipment; it is now serving many sections which the railway never reached and its patronage is growing steadily. Whether the price of cotton—on which the prosperity of this section depends to a certain degree—will have any bearing on the popularity of the bus lines remains to be seen. So far there has been little if any diminution in the sales of automobiles, even though cotton is selling below the cost of production.

The jitney is gradually being eliminated—not through action of the City Council—and indications are that it will soon disappear from the residential sections and confine its activities to the business district.

When the buses put on a fare of 5 cents for school children a number of jitneys emulated the example and on the windshields of the jitneys were displayed signs reading "School Children, 5 Cents." This competition, however, continued only about one week, when the jitneys removed their signs. The jitneys operate without regular schedule, are hard to locate in rainy weather and have many objectionable features, but they have not been outlawed by the City Council and so are competing on an even basis with the bus lines. Their regular fare is 10 cents to any point in the city limits.

The railway is now charging 10 cents for each passenger, as is the bus company, but interchangeable transfers are given between the trolleys and the buses without extra charge.

For a time the bus company sought to have the jitney competition regulated and once threatened to quit operations on some lines unless Council restrained

the jitneys. Now the bus company is getting on its feet, is providing good schedules and is giving dependable service. The working agreement between the Carolina Transit Company, operating the buses, and the company operating the trolley lines indicates the community of interest that exists between these two carriers.

Would Operate Buses in Hudson

The Eastern New York Transportation Corporation, a subsidiary of the Eastern New York Utilities Corporation, Albany, N. Y., filed a petition with the Public Service Commission recently for permission to operate a bus line in the city of Hudson and the town of Greenport, Columbia County.

The company proposes to substitute buses for street cars in Hudson and to operate no fewer than three buses on the routes set forth in the consent of the city on a twelve-minute schedule between the hours of 6 a.m. and 11 p.m. The rate of fare for one continuous ride from one point to another on the route is to be 8 cents, with transfer privileges to and from interurban buses and interurban cars operated by the Eastern New York Utilities Corporation.

Holyoke Argument Heard

Power of states to require interstate bus companies to get licenses before operating within their limits was argued in the Supreme Court on Oct. 28 in a case from Massachusetts involving the Interstate Buses Corporation of Connecticut and the Holyoke Street Railway and others. The bus lines paralleled the railway a part of the distance from Hartford, Conn., to Greenfield, Mass., and the railway succeeded in the courts in Massachusetts in enjoining its operation and having fines and imprisonment imposed upon its operators. The bus company contended that the Massachusetts law was unconstitutional and in restraint of interstate commerce. Counsel for the railway based his argument largely upon the police power of the state to control the use of its highways.

New Feeder Service by Mesaba Railway

Bus service between Virginia Center and environs has been started by the Mesaba Railway Coach Company, Virginia, Minn., a subsidiary of the Mesaba Railway. James C. Chestnut, receiver, said the service, which would continue regularly until April 30, was instituted for the convenience of the public during the winter months. Buses will operate at regular intervals in accordance with time cards printed and distributed throughout the territory served.

Fare to the north and south side from Virginia Center will be 7 cents and between Virginia Center and West Virginia 10 cents, and also between the north side and south side. A 15-cent fare will be charged between West Virginia and the north side. Coupons, honored in this service, will tend to reduce fares about 10 per cent.

Financial and Corporate

\$15,000,000 Berlin Issue Offered in American Market

Speyer & Company, Equitable Trust Company and Blyth, Witter & Company, New York, offered on Nov. 12 at 94½ and interest, to yield 6.95 per cent, \$15,000,000 of Berlin Electric Elevated & Underground Railways 30-year first mortgage 6½ per cent sinking fund gold bonds. Of the issue \$3,000,000 was withdrawn for sale in Holland by Hope & Company, Teixeira de Mattos Brothers and Deutsche Bank, Amsterdam.

The city of Berlin, which (directly or through a corporation wholly owned by the city) owns a majority of the company's stock, has entered an agreement with the company providing that fares will be maintained adequate to insure earnings which will cover operating expenses, interest and sinking fund on all loans and proper provision for depreciation and other necessary reserves and that if, for any reason, the fares should not be maintained at rates adequate to insure sufficient earnings available for such purposes, the city will provide the funds necessary therefor.

The bonds are part of a total authorized issue limited to \$25,000,000 (or equivalent in reichsmarks). The remaining bonds may be issued under restrictions to be set forth in the indenture.

Proceeds of this issue will be used for betterments, additions and equipment, for the payment of floating debt incurred in construction of lines acquired from the city and of extensions recently placed in operation, for the redemption of 13,463,700 reichsmarks (\$3,205,261) outstanding bonds and other obligations, and for other corporate purposes.

The company was organized in 1897 as a private corporation and began operation in 1902. It owns about 28.7 miles of elevated and underground lines and operates a total, including connecting lines, of about 33.1 miles. These lines constitute the entire electric rapid transit system now in operation in Berlin, third largest city of the world, with a population of about 4,000,000.

Offer to Exchange Norfolk Stock

In line with plans to simplify its corporate structure the Virginia Electric & Power Company, largest subsidiary of Engineers Public Service, has made an offer to the stockholders of the Norfolk Railway & Light Company for the purchase or exchange of their stock. Two alternative offers are made: \$33 a share in cash, or one share of 6 per cent cumulative preferred stock of the Virginia company and \$9 in cash for each three shares of the Norfolk company. The holders of a large proportion of the capital stock of the Norfolk company have already agreed to one or the other of the options.

One of the purposes of a special meeting of stockholders of the Virginia Company to be held on Nov. 23 is to reclassify the unissued 7 per cent preferred stock into a 6 per cent stock, which will then be available under the terms on the offer to the Norfolk company stockholders.

Stockholders of the Virginia company will also be asked to ratify an offer of an additional \$9,000,000 first and re-funding 5 per cent bonds.

Another Excellent Year in Brooklyn

Company Operating Rapid Transit and Surface Lines Reports Net Income of \$5,748,187 for Year, an Increase of \$674,652—269,233,866 Surface Passengers and 623,099,695 Rapid Transit Riders

CONSOLIDATED net income of the Brooklyn-Manhattan Transit Corporation, Brooklyn, N. Y., for the year ended June 30, 1926, was \$5,748,187, an increase of \$674,652 over the previous year. This and other facts concerning the operations of the company for the year were reported to the board of directors on Nov. 15. This is the third report of the company, which is the successor to the Brooklyn Rapid Transit Company.

During the last three years the expenditures for maintenance of way and structures and of equipment, including reserves for depreciation, have totaled \$21,354,371, which is 24.22 per cent of the total operating revenues of \$88,153,384 for the three years.

There were paid, for the fiscal year, on the outstanding preferred stock, four quarterly dividends, aggregating \$1,496,808, and on the outstanding common stock, dividends of \$2 per share for the period from the organization of the corporation to Sept. 30, 1925, and two quarterly dividends of \$1 each, aggregating \$3,079,644.

This shows that the increase in eight years in passengers on the rapid transit

lines has been 134.7 per cent and the increase on the system 71.2 per cent. It also shows that the surface lines are carrying 30.1 per cent of the total traffic.

In discussing the rapid transit lines Gerhard M. Dahl, chairman, says:

The city is now proceeding with the completion of the Fourteenth Street-Eastern line, with the construction of shops and storage tracks near Coney Island, and with the lengthening of certain station platforms to accommodate eight-car trains. In anticipation of requirements for additional equipment your rapid transit operating subsidiary, the New York Rapid Transit Corporation, during the preceding year had under construction twelve cars, comprising four units of articulated cars, designed to produce greater efficiency and safety in operation. They were completed and placed in operation on Aug. 31, 1925, and proved so satisfactory that contracts were placed for 201 additional cars, comprising 67 units of such articulated cars. Deliveries are expected to start in December. The work of assembling and equipping these cars will be undertaken at the Coney Island Shops.

The city has not yet started work on the construction of the Nassau-Broad line. This line, with the added facilities mentioned above, would materially increase the capacity and efficiency of the rapid transit lines under contract No. 4.

The city completed the Extension of the Fourth Avenue line from 86th Street to 95th Street, Brooklyn, and your corporation did the necessary equipment work and placed that extension in operation on Oct. 31, 1925.

The first annual report stated briefly the provisions of contract No. 4 as to the disposition of revenue arising from operations under the contract. The New

STATEMENT OF BROOKLYN OPERATION UNDER CONTRACT WITH CITY

	Year Ended June, 30 1926	Period Aug. 4, 1913, to June 30, 1926
Revenue.....	\$32,418,173	\$246,848,204
Operating deductions and corporation's first preferential.....	26,146,489	223,974,523
Balance available for return on new money invested under contract.....	6,271,684	22,873,681
Corporation's second preferential, representing interest and sinking fund on corporation's contribution to construction and equipment under contract.....	5,501,355	40,114,550
Balance above corporation's second preferential.....	770,328	.....
Deficiency representing amount by which revenue failed to equal interest and sinking fund on corporation's contribution to construction and equipment under contract.....	.....	17,840,868

PASSENGERS CARRIED

Fiscal Year	Surface	Rapid Transit	Totals
1918	255,569,584	265,400,020	520,969,604
1919	251,893,227	313,933,642	565,826,869
1920	278,832,742	380,190,890	659,023,632
1921	223,006,425	406,695,310	629,701,735
1922	250,412,364	446,384,508	696,796,872
1923	262,992,795	482,584,090	745,576,885
1924	266,421,409	539,069,076	805,490,485
1925	271,800,914	593,368,990	865,169,904
1926	269,233,866	623,099,695	892,333,561

York Rapid Transit Corporation is entitled to its operating and preferential deductions, including cumulative deficiencies thereof, ahead of any payments to the city. The accompanying table shows the order in which deductions are to be made from revenues and the application of revenues thereto, together with the cumulative deficiencies. It will be observed that the earn-

COMPARATIVE STATEMENT OF EARNINGS AND EXPENSES OF THE BROOKLYN-MANHATTAN TRANSIT SYSTEM FOR YEAR ENDED JUNE 30

	1926	1925
Revenue from Transportation:		
Passenger revenue.....	\$42,803,047	\$41,383,763
Freight revenue.....	672,689	675,183
Chartered car revenue....	532	716
Miscellaneous transportation revenue.....	521	641
Chartered bus revenue....	70,494	13,331
Total revenue from transportation.....	\$43,547,284	\$42,073,635
Other Street Railway Operating Revenues:		
Advertising.....	\$656,000	\$656,000
Other car and station privileges.....	387,925	381,941
Rent of buildings and other property.....	171,597	150,900
Rent of equipment.....	802	240
Rent of tracks and terminals.....	21,035	21,634
Miscellaneous receipts....	56,322	28,065
Total other street railway operating revenues...	\$1,293,682	\$1,238,781
Total street railway operating revenues...	\$44,840,967	\$43,312,417
Operating Expenses:		
Maintenance of way and structures.....	\$4,721,411	\$4,474,266
Maintenance of equipment.....	6,071,133	6,087,560
Operation of power plant.....	3,263,336	3,240,270
Operation of cars—trainmen's wages.....	6,952,159	6,872,091
Operation of cars, other expenses.....	4,310,478	4,193,723
Damages.....	1,616,237	1,416,701
Legal expense in connection with damages....	218,625	198,978
General law expenses....	106,047	134,985
Other general expenses....	1,492,075	1,309,152
Freight expenses.....	469,332	493,660
Total operating expenses.....	\$29,220,839	\$28,426,390
Net revenue from operation.....	\$15,620,127	\$14,886,026
Taxes accrued on operating properties.....	3,260,384	3,068,461
Operating income.....	\$12,359,742	\$11,817,564
Non-Operating Revenue:		
Rents accrued from lease of road.....	\$62,703	\$60,571
Miscellaneous rent revenues.....	156,535	287,276
Interest revenues.....	783,731	544,337
Dividend revenues.....		666
Miscellaneous.....	179,841	192,558
Total non-operating revenues.....	\$1,182,810	\$1,085,408
Non-Operating Revenue Deductions:		
Rent expense.....	2,317	827
Net non-operating income..	\$1,180,492	\$1,084,581
Gross income.....	\$13,540,235	\$12,902,146
Income Deductions:		
Interest deductions.....	\$7,462,322	\$7,475,760
Rent for lease of other road and equipment....	25,000	25,000
Other rent deductions....	286,770	309,677
Sinking fund accruals....	658	658
Amortisation.....	3,125	3,125
Total income deductions	\$7,777,877	\$7,814,221
Balance.....	\$5,762,358	\$5,087,925
Less—Accruing to minority interests.....	14,171	14,390
Net income.....	\$5,748,187	\$5,073,534

ings for the year showed an excess over the year's deductions, applicable to the cumulative deficiency, as did the earnings of last year, and that the cumulative deficiency now totals \$17,240,868 as the result of determinations made by the Transit Commission under provisions of the contract, which disposed of undetermined items of cost up to June 30, 1925.

Mr. Dahl says that with a continuation of favorable operating conditions and particularly with the additional facilities that the city is obligated to provide, it is hoped that the net revenue will continue to increase so that the cumulative deficiency of full deductions may be gradually made good.

The accompanying condensed com-

parative summary gives the results of operations under the contract with the city for the year ended June 30, 1926, and also for the thirteen-year period from the commencement of operation under the contract, namely, Aug. 4, 1913, to June 30, 1926.

North Jersey Transit Deal Approved

The Board of Public Utility Commissioners of New Jersey has sanctioned the sale of the cars, franchises, right-of-way and other property of the North Jersey Rapid Transit Company to the Public Service Railway for \$200,000. Confirmation of the transfer was asked by Henry H. Parmelee, receiver for the transit company, the sale already having been approved by the Court of Chancery. Reference to the proposed sale was made in the *ELECTRIC RAILWAY JOURNAL* for Nov. 6, page 864.

Approving of Refunding Operation Sought at Boston

The Boston Elevated Railway, Boston, Mass., has petitioned the Department of Public Utilities for authority to issue \$4,656,000, par value, 30-year, 6 per cent bonds to refund two bond issues of the West End Street Railway assumed by Boston Elevated on the consolidation of the two companies. The West End issues are \$2,700,000 maturing on Feb. 1, 1927, and \$1,956,000 maturing on May 1, 1927.

Reasons Given for Geneva Receivership

Justice Benjamin B. Cunningham of the Supreme Court has appointed Lansing S. Hoskins and James M. Ryan, both of Geneva, N. Y., receivers of the Geneva, Seneca Falls & Auburn Railroad, operating 15 miles of electric railway between Geneva and Seneca Falls and buses in the city of Geneva.

As noted in the *ELECTRIC RAILWAY JOURNAL* for Oct. 30, page 827, this action came when the company was unable to pay interest on an issue of \$507,000 of first mortgage 5 per cent gold bonds issued July 1, 1913, with the Chatham-Phoenix National Bank & Trust Company, New York, as trustee.

Lansing G. Hoskins, attorney for the railroad and father of one of the receivers, issued the following statement in explanation of the receivership:

This road has been unable to meet the interest charges on its bonds during the present year, although the rate of interest during the preceding year was reduced to 3 per cent, and necessarily the trustee under the mortgage was compelled to commence foreclosure.

The gross earnings of this company have steadily decreased, while taxes, special franchise taxes, gross earnings taxes and paving assessments continued to accrue. The number of passengers carried on the city line in 1924 was 212,947 and in 1925 was 159,379.

The number of passengers carried on the interurban line during 1924 was 537,717 and in 1925 was 463,375.

Owing to the fact that the operating expenses of the Geneva line exceeded its receipts, the company was forced to abandon this line and substitute buses for street cars.

The revenue of the road has been steadily declining for ten years. The situation, both as to decrease of revenue and, necessarily, of passengers carried, is due largely to private automobile operation and com-

petition, while operating expenses, taxes and paving assessments have not materially decreased.

The complaint of Carter, Ledyard & Milburn, New York City, the attorneys for the plaintiff bank, sets forth that, in addition to the mortgage, the company owes city, county, state and school taxes for 1925 and 1926 to the city of Geneva, the town of Waterloo, village of Waterloo, town of Seneca Falls and village of Seneca Falls.

It is further alleged that the company owes the state for gross earnings tax for 1925 and 1926.

During pendency of the case, the interurban railway and the Geneva bus system will be operated as usual, receivers stated.

\$380,424 Surplus in Denver in Nine Months

Total operating revenue of \$3,399,975 and a balance of \$380,424 for depreciation and surplus after payment of expenses, taxes, bond interest, dividends on 5 per cent preferred and other charges are shown in a state-

Total operating revenue.....	\$3,399,975
Operating expenses (not including depreciation).....	1,823,123
Taxes.....	413,664
Total operat. exp. and taxes.....	\$2,236,787
Net operating income.....	1,163,170
Total miscellaneous income.....	41,555
Gross income less operating expenses and taxes.....	\$1,204,726
Interest on underlying bonds.....	190,280
Balance.....	\$1,014,446
Interest on general and refunding 5 per cent bonds.....	241,631
Balance.....	\$772,814
Less net and loss charges (estimated)....	1,775
Balance available for depreciation and for dividend requirements on 104,164 shares of preferred stock.....	\$771,039
Five per cent dividend.....	390,615
Balance for deprec. and surp.....	\$380,424
* Equals 6.33 times interest on underlying bonds.	
† Equals 4.20 times interest on general and refunding bonds.	

ment of the Denver Tramway, Denver, Colo., for the nine months' period ended Sept. 30.

Abandonment Hearing Before Commission

A further hearing was held before the Public Service Commission on Nov. 12 on petition of the Hudson Valley Railway for permission to abandon that portion of its line between the villages of Thomson and Greenwich and the village of Lake George and the Hamlet of Warrensburgh. At the beginning of the hearing Judge Kiley of Glen Falls applied for adjournment to a subsequent date to permit the town of Warrensburgh to submit to the people of that town the question of whether counsel should be employed by the town board to oppose the abandonment of the Lake George-Warrensburgh branch. The commissioner decided to continue the testimony relating to the Thomson-Greenwich branch and to continue the hearing on Dec. 7 as to the future of the Warrensburgh lines. Evidence was submitted at the hearing as to the earnings of the company and expendi-

tures required to keep these lines in satisfactory operating condition, also as to the number of passengers carried and general operating conditions in the territory served by these roads.

Bonds of Crawford County Railways Called

All of the outstanding first mortgage 40-year 6 per cent sinking fund gold bonds of the Crawford County Railways, Erie, Pa., dated July 1, 1921, have been called for payment on Jan. 1, 1927, at par and interest at the office of the Irving Bank & Trust Company, New York City. The Northwestern Electric Service Company of Pennsylvania, successor company, announces that it will purchase at any time before Jan. 1, 1927, any or all of the bonds presented at the principal office of the National Bank of Commerce, New York, at par and interest to the date of purchase. Holders have the option of exchanging their bonds into Associated Gas & Electric Company preferred stock.

American Foreign Buys Havana Stock

The stockholders of the American & Foreign Power Company at a special meeting on Nov. 13 approved the acquisition of the Electric Bond & Share Company's holdings of Havana Electric & Utilities Company.

They also authorized the issuance of 300,000 additional shares of common stock, which will be to pay for the Havana Electric stock.

Financial Structure of Brooklyn City to Be Changed

Stockholders of the Brooklyn City Railroad, Brooklyn, N. Y., will vote on Nov. 23 on a proposal to increase the authorized capital stock of the company from \$16,000,000 to \$18,500,000, each share to be of a par value of \$10. At the same meeting the stockholders will vote on a proposal to approve an issue of convertible bonds to be issued in series. These proposals are being put before the stockholders as part of a plan which it is expected will result in the revamping of the financial structure, particularly with respect to creating an open end mortgage which will facilitate future financing.

Northern Cambria Road Sold

The Northern Cambria Railway, Johnstown, Pa., operating from Carrolltown through northern Cambria County towns to Barnesboro, has been abandoned and all articles of equipment disposed of at public auction to Roberts Brothers, Philadelphia, for \$29,800. The Northern Cambria Bus Company, a subsidiary, was sold to Fred J. Fees, Ebensburg, for \$4,100. The real estate of the railway, known as Sunset Park, Patton, was sold to Roberts Brothers and Joseph B. Broan, Philadelphia, for \$4,000. Work on removing the tracks has been started. The sale of the line was under an order of the Ebensburg Trust Company, receiver. The system comprised 13 miles of line.

\$14,553,437,951 Stock Value for Utilities

The fair value of the capital stock of all public utility corporations making returns in 1924 was \$14,553,437,951, the bureau of internal revenue shows in statistics just made public. The subdivisions making up that total are: Steam railroads, \$5,470,184,648; electric railroads, \$462,973,378; all other railroads, \$432,349,391; water transportation, \$562,582,366; local transportation (cabs, delivery, etc.), \$104,586,361; electric light and power companies, \$1,580,465,582; gas companies, \$909,056,432; telephone, telegraph and radio companies, \$1,976,406,393; water works, \$235,999,978; storage companies, \$415,390,808; other public utilities, \$2,319,330,273; lessor companies, steam and electric railroads, \$32,595,542; lessors of public utilities, \$51,516,799.

M. J. Ellis Gets Rockford Properties

The railway system centering at Rockford, Ill., was sold at auction on Nov. 15 to Milton J. Ellis, Beloit, for \$550,000, subject to confirmation by the Circuit Court. This sale follows a court order entered recently by Judge E. D. Shurtleff in the Winnebago County Circuit Court calling for the sale of all properties of the Rockford City Traction Company, Rockford & Interurban Railway and Rockford, Beloit & Janesville Railway. The petition for the order for sale was presented by the Continental & Commercial Trust Company, Chicago, trustee representing holders of the first mortgage bonds.

Mr. Ellis, who bought the property, had recently acquired a majority of outstanding bonds at about 23 cents on the dollar.

Bondholders Take Utah Property

The Utah-Idaho Central Railroad, Ogden, Utah, was purchased on Nov. 5 at a receivers' sale by a committee of bondholders for \$1,500,100. Acting under an order made by Judge Tillman D. Johnson of the United States District Court, P. H. Mulcahy, receiver and former general manager of the company, made the sale. James A. Howell, of counsel for the railroad, explained that the sale would be subject to rights which the Bamberger Electric lines had with the Utah-Idaho Central under a contract made Oct. 6, 1914.

The bid made by the representative of the bondholders was for two parcels of the company's assets. The first parcel included the stock of the Utah Rapid Transit Company. It brought \$100. The second was all assets and stock of the Utah-Idaho Central, which brought \$1,500,000. He said that bondholders of the Utah-Idaho Central Railroad owned all of the preferred and common stock of the railroad company and held about \$300,000 in unpaid bond coupons.

The present Utah-Idaho Railroad is an outgrowth of the joining of the street railway systems of Ogden and Logan. The consolidation was made in 1914, when the company was building the present line which extends from Ogden to Preston, Idaho. When the company was formed it was known as

the Ogden, Logan & Idaho Railroad. Early in 1919 the name was changed to Utah-Idaho Central Railroad. The change in name was made in order to avoid any confusion in the identity of this railroad and the Oregon Short Line by the common use of the initials of each road. With the increasing use of the automobile and truck, the business of the company diminished and led to the receivership, on Aug. 20 last. An action brought by the Westinghouse company in the federal court resulted in the appointment of Mr. Mulcahy as receiver. When the receiver was named, Judge Johnson ordered an investigation to determine if the receivership could not be worked out, but an adverse report was made, resulting in the order for the sale.

Attorneys for the railroad intended to go into the federal court on Nov. 15 to seek approval of the sale. It was said unofficially that a new company would be formed to operate the road.

Earnings at Minneapolis Increase

Earnings of the Twin City Rapid Transit Company, Minneapolis, Minn., for the third quarter and the first three quarters of the year show gains over 1925. Net income for the quarter was \$178,639, compared with \$56,387 in 1925; for the nine months \$901,085, compared with \$714,610. The controller's figures are as follows:

	1926	1925
Third quarter		
Gross revenues.....	\$2,881,885	\$2,847,326
Operating expense....	2,161,170	2,253,774
Net revenue.....	\$714,715	\$593,522
Fixed charges, taxes	536,075	537,165
Net income.....	\$178,639	\$56,387
Nine months—		
Gross revenues.....	9,479,051	9,231,792
Operating expense ..	6,913,957	6,853,484
Net revenue.....	\$2,565,094	\$2,378,307
Fixed charges, taxes	1,664,008	1,663,696
	\$901,085	\$714,610

Coal Belt Line to Suspend.—The Coal Belt Electric Railway, Marion, Ill., operating from Marion to Herrin, Carterville and other points in Williamson County, Illinois, has been authorized by the Illinois Commerce Commission to discontinue service. No date for quitting has been set. The line had been leasing its rails to the Missouri Pacific Railroad. The cars of the electric railway were used mostly by coal miners in getting to and from work. The company operated 14 miles of line.

Loss in Youngstown in September.—Deficit resulting from operation of the Youngstown Municipal Railway, Youngstown, Ohio, during September was \$7,808, which is \$11,300 less than for a similar month last year, according to the monthly report of Traction Commissioner Engle. Though the income was higher this year, there was slightly more capital upon which to pay a return. Capital value in September, 1925, was \$4,125,288 compared with \$4,184,429 for September of this year. Other comparative figures for September of this year in relation to September, 1925, are: Increase of \$10,240 in income from bus operation, and an increase of \$2,520 in income from railway operation.

Personal Items

J. C. Johnson Superintendent of Shore Line Coach Company

Jasper C. Johnson has resigned as general superintendent of transportation for the Aurora, Elgin & Fox River Electric Company, to become superintendent of operation in charge of the main line division of the Shore Line Motor Coach Company, a subsidiary of the Chicago, South Shore & South Bend and the Gary Railways.

Mr. Johnson entered the service of the Aurora, Elgin & Fox River Electric, then known as the Aurora, Elgin & Chicago Railroad, as a conductor in 1910. He was subsequently made motorman, dispatcher, service inspector and finally, in 1920, was promoted to division superintendent. In addition to his duties with the railroad, where he also had charge of several auxiliary bus lines, Mr. Johnson has been a director of the Illinois Motor Transportation Association for a number of years.

With the Shore Line Motor Coach Company he will be responsible for the operation of all through routes, particularly the newly established service between Chicago, Ill., and Grand Rapids, Mich. For the time being his headquarters are to be located in Michigan City, Ind.

A. D. McWhorter, Jr., has become affiliated with the Carolina Power & Light Company in Raleigh, N. C. Mr. McWhorter is a son of the general superintendent of the Memphis Street Railway, Memphis, Tenn. He was graduated from the University of Tennessee. During last year he was associated with the General Electric Company of Schenectady and Erie.

Arthur W. Thompson, president of the United Gas Improvement Company, Philadelphia, Pa., has succeeded Walton Clark, Philadelphia, as director of the subsidiary companies of the Public Service Corporation of New Jersey. Mr. Clark was elected a director of Public Service Corporation of New Jersey at the time of its organization on June 3, 1903, and a director of each of the underlying companies as it was organized. The companies the directorate of which he leaves include the Public Service Electric & Gas Company, Public Service Electric Power Company, Public Service Railway, Public Service Production Company, Public Service Transportation Company, Public Service Railroad and the Public Service Stock & Bond Company.

E. F. Hirsch, has resigned from the West Penn Railways, Pittsburgh, Pa., to take up his new work with Harper & Turner, investment bankers, in Philadelphia, Pa. Mr. Hirsch has been an employee since July, 1919, when he came with the company as an assistant to E. D. Dreyfus on appraisals and investigations. In the spring of 1922 he was made an assistant in Vice-President R. B. Keating's office and in August,

1924, he was promoted to the position which he held at the time of his resignation as assistant to Vice-President C. P. Billings. Mr. Hirsch was graduated from Carnegie Institute of Technology and attended night school at the University of Pittsburgh for five years, taking law and finance.

Colonel Wallace Leaves Detroit

Manager of Municipal Railway Tenders Resignation to Take Effect on Jan. 1

Col. H. U. Wallace, general manager of the Department of Street Railways at Detroit, Mich., tendered his resignation on Nov. 17 to the Street Railway Commission to take effect on Jan. 1. Colonel Wallace will take a much-



Col. H. U. Wallace

needed rest before he announces his future plans.

Colonel Wallace took to his task at Detroit, upon which he entered in June, 1925, 30 years of engineering and railroading experience. Just before going to Detroit he was assistant general manager of the Knoxville Power & Light Company, with direction of all of that company's railway activities. In fact he supervised the reorganization of the railway department there.

Colonel Wallace was born in Rock Island, Ill., in 1872. He is the son of John Findley Wallace, chief engineer of the Panama Canal under President Roosevelt. He was graduated from Purdue University and in 1894 was engaged as assistant engineer for the Illinois Central Railway. During his years of service with that railroad, of which his father was general manager, he was resident engineer in charge of the Illinois Central's lake front improvements, roadmaster of the Chicago division, roadmaster and assistant superintendent of the Louisville division and superintendent of the Louisville and Freeport divisions.

From 1903 until 1906 he was chief engineer of the Illinois Central in

charge of all maintenance and construction work. He resigned in 1906 to become third vice-president of J. G. White & Company, New York, in charge of construction work. He was later general manager of the Chicago, Lake Shore & South Bend Railway, which he operated for eighteen months. He resigned this position to go into business as consulting engineer in Chicago. His return to active railroading was as vice-president in charge of operation and reconstruction of the Fort Dodge, Des Moines & Southern Railway.

In 1912 Colonel Wallace inspected the holdings of the Northern Colorado Power Company. As a result of his work on this property and his recommendations a new company, the Western Light & Power Company, was organized.

During the World War he was commissioned as major of engineers and assigned to the construction division as supervising construction officer of a large number of important ordinance plants.

George A. Iler has resigned as chief electrical engineer of the Pennsylvania-Ohio Electric Company, Youngstown, Ohio, to look after his commercial interests. He will devote his time to the development of several articles he has patented. Just prior to his departure Mr. Iler was the guest of members of the Officers' Club at dinner at the Poland Country Club and at a similar affair by his associates in the engineering and line department.

Obituary

C. S. Cook

Charles S. Cook, vice-president and treasurer of the Kaestner & Hecht Elevator Company and formerly with the Westinghouse Electric & Manufacturing Company and the Duquesne Light Company, died in Pittsburgh on Nov. 15. Mr. Cook was widely known in electrical, manufacturing and business circles. He had been identified with the electrical industry since 1887 and was an outstanding figure in the electric light and power field, street and urban railway development and the electrification of street railways.

In 1904 he was made manager of the railway and lighting department of the Westinghouse company at East Pittsburgh. In 1917 he became general manager of the Duquesne Light Company and later vice-president. He had been with the Kaestner & Hecht Company since early in 1924. He was a native of Amherst, Mass., and was graduated from Worcester Polytechnic Institute.

C. E. Warren

Charles Edward Warren, long connected with the New York Railways and its predecessors and with the Interborough Rapid Transit Company, New York, died at New London, Conn., on Oct. 3. By reason of his close application to the various interests under his charge, he became fairly familiar with nearly every detail and feature of electric railway affairs, and possessed more than ordinary ability,

being fully qualified to speak with rare intelligence on most any subject connected with electric railway work.

Mr. Warren was born and educated in Philadelphia. He became identified with the Broadway & Seventh Avenue Railroad, New York City, in 1886 and a short time afterward was made secretary of that company. Later he became vice-president of the company as well as vice-president of the Metropolitan Street Railway. When the surface railways in the old city of New York were consolidated in 1894 he was also made an officer of the underlying or subsidiary company. This was before the formation of Greater New York. He was secretary of the New York City Railway and served in that capacity until the reorganization in December, 1911. He then became vice-president and transfer agent of the New York Railways and later vice-president of the Interborough Rapid Transit.

W. H. Long

W. H. Long, superintendent of power of the York Railways, York, Pa., and general superintendent of the Edison Light & Power Company, which is controlled by the railway and supplies power to it, is dead. The death of Mr. Long marked the passing of a man who has given 40 years of his life to public service in York. To his unusual resourcefulness and energy, judgment and decision is due very largely the successful development of the present extensive light system at York.

Mr. Long enlisted in public service when electric lighting was in its nascent state, served through the early years of progress of the art as engineer of the Edison power station, and rose to general superintendent of the Edison company at the beginning of the era of development of the electric power industry.

In that position he had full charge of the physical property of this public utility, from its power generating station to the point of use by the consumer, and the expansion of these facilities to meet public needs.

Hugh A. Heulings, sales representative of the J. G. Brill Company, Philadelphia, died on Nov. 12 at his home in Moylan, Pa., after an illness of several months. Mr. Heulings had been affiliated with the Brill organization since 1902, and with the exception of a few years when he was with the American Car Company, the Brill subsidiary in St. Louis, had been located at the Philadelphia plant. In recent years he devoted his attention mainly to bus body sales. Mr. Heulings was a brother of the late William H. Heulings, Jr., formerly vice-president and general manager of sales of the Brill company. He was 53 years old.

Walter H. Nelson, who represented the Ohmer Fare Register Company, Dayton, Ohio, for a number of years as an installing agent, died on Nov. 3. Mr. Nelson had a great many friends among electric railway men and his death will be a matter of sincere regret to those who knew him. He had been an employee of the Ohmer Fare Register Company for more than 25 years.

Manufactures and the Markets

News of and for Manufacturers—Market and Trade Conditions
A Department Open to Railways and Manufacturers
for Discussion of Manufacturing and Sales Matters

Compressor Mounting for Buses Discussed by Christensen

The seventh of an informative series of publications on bus brakes has been issued by the Christensen Air Brake Company, Cleveland, Ohio. It is called "Compressor Mountings and Drives." Other topics, namely, compressor cooling, control valve and maintenance on different types, will appear in the above order.

The latest of the series on the A B C's of bus brakes and braking systems states that there are three general types of compressor mountings. Front end: mounted on the front cover plate of the vehicle engine and driven direct from an eccentric on the main crankshaft. Side: mounted beside the vehicle engine and driven by gears, chains, belts, an auxiliary shaft, or some combination of these. Transmission: mounted beside the transmission and driven through gears from a special power take-off.

The side and transmission mounted compressors are not difficult to install and can be put on practically any vehicle. However, if the compressor is efficient, trouble usually develops in the drive, particularly on the side-mounted type. The pulsating compressor load wears gears, chains, and universals rapidly. Chains and universal renewals are common, and where the timer is driven from the same shaft timing trouble appears. The transmission-mounted compressor is less subject to drive trouble, as only gears are used and, of course, no timer or other trouble can develop from it. However, it is inclined to become noisy and is not the simplest or most satisfactory installation.

The front-end mounting and drive is

by far the simplest and most rugged. When installed it is practically a part of the motor and not a piece of auxiliary apparatus. An eccentric on the main engine crankshaft drives it. There are no gears, chains or universals. The compressor hasn't even a crankshaft of its own. It has less than half the number of parts contained in any self-contained or auxiliary compressor. Vibration is reduced to the lowest possible point because the pulsations are absorbed by the main engine crankshaft and bearings—those designed for the heaviest duty.

Not all motors at present can take a front-end mounted compressor, but wherever possible it is much to be preferred from every standpoint—installation, operation and maintenance.

Warner Builds Freight Trailers and Removable Bodies

Six automatic detachable semi-trailers, to be operated with twenty removable bodies in extending freight business on a door-to-door basis, have been ordered by the Rockford & Interurban Electric Railway of Rockford, Ill., operating through Beloit, Wis., and surrounding towns. With this fleet of tractor-drawn trailers equipped with removable bodies, the railway company expects to eliminate four steps in freight handling, to do away with transit losses due to theft, breakage, etc., to cut the cost of receiving and delivering goods, increase its freight business in the territory served, and vastly enlarge its area. It expects to enlarge its freight business from 800 to 1,000 per cent.

L. P. Warner, vice-president of the Warner Manufacturing Company, which



Removable Body is a Separate Unit and May Be Left with Shippers for Loading and Unloading

is building the trailers and bodies, stated that already six other electric railway companies have under consideration the adoption of similar installations recommended by committees of engineers which have examined the Rockford & Interurban trailer fleet.

The mechanical equipment that is responsible for this development in the Rockford & Interurban Company's freight handling consists of a fleet of Warner automatic detachable trailers—standard commercial semi-trailers with a 4-ton capacity—equipped with removable bodies that can be run on and off the trailers without difficulty. It is estimated that a single tractor can serve five trailers and 25 bodies.

When a shipper announces he has a shipment of merchandise the tractor couples to a trailer and goes to the

shipper's door, where it drops the trailer and departs. The body is run into the shipper's warehouse, if desirable, and loaded at his convenience. It is then locked and run back on the trailer. The railway, when notified, dispatches the tractor to pick up the trailer, which is dropped again at the nearest rail terminal, where the body is run into a car direct from the trailer. The process is repeated at the delivery end and the body arrives under lock and key at the consignee's door. It is unloaded by him.

The trailers ordered by the Rockford & Interurban will be stationed in Rockford, Freeport, Beloit, Janesville and Belvidere. The bodies are 12 ft. long, 5 ft. 10 in. high, and 6 ft. wide. A railway flat car can accommodate three of them.

Electric Locomotive for Great Northern

Inspection Held at Plant of Westinghouse Company in Pittsburgh—F. H. Shepard Explains Features of New Equipment

THE world's largest motor-generator locomotive was inspected on Nov. 16 at Pittsburgh by prominent railway officials and members of the Railway Club of Pittsburgh. The locomotive is the first completed of those ordered by the Great Northern Railway for operation in mountain service over the Cascade Mountain grade in Washington. It will be used on all trains operating on the electrified division of the road, which runs from sea level to the Cascade Mountains and includes one of the longest and steepest mountain grades in America. The 24-mile section over which the locomotive will initially operate runs from Skykomish, Wash., to the eastern portal of the Cascade tunnel.

In discussing the locomotive, F. H. Shepard, director of heavy traction for the Westinghouse company, said:

This locomotive makes it possible to combine the principles of high-voltage alternating current, transmitted over great distances from great hydro-electric stations, and the direct-current motor, which is no more complicated than the street-car motor in use on a hundred thousand trolley cars in America. Power is drawn from an overhead trolley which carries an 11,000-volt alternating current. This is then passed through a transformer and motor-generator set by which it is converted into direct current for the traction motors. Having the facilities to convert power embodied in the locomotive eliminates the requirement of numerous substations for this purpose erected at intervals along the right-of-way. Furthermore, the power is converted just as it is used by the locomotive.

The motor-generator locomotive is a development from the first of this type built in 1925 at the Ford plant in Detroit with equipment of the Westinghouse company and now in use on the Detroit, Toledo & Ironton, Henry Ford's railroad.

A wide range of operating speeds is available with this new engine; in the case of the Great Northern, full power at any speed from 2 to 35 m.p.h. can be obtained, while the ordinary direct-current motors have only a very limited number of running speeds.

In order to negotiate curves the locomotive is divided into two cabs. It has a total length of nearly 100 ft. and weighs 680,000 lb. It can exert 7,000 hp. under maximum conditions, which makes it rank with the most powerful electric locomotives ever built and far outranks any steam locomotive. The locomotive has a continuous rating of more than 3,500 hp. at a speed of 15 m.p.h., has eight driving motors and operates from an 11,500-volt, 25-cycle overhead trolley.

These huge locomotives are for the purpose of surmounting at double steam speed

the heavy grades of the Cascade Mountains, rising abruptly from the Coast in Washington. The present line of the Great Northern crosses these mountains at an elevation of 3,385 ft.

An important feature of the new locomotives is the system of regenerative braking effective at all speeds by which the heavy trains can be taken down the mountain grades without the use of airbrakes. This is accomplished by utilizing the traction motors as generators. The descending train generates power which is fed back into the trolley and to the power system for any other trains or general power use, while at the same time controlling the speed of the train.

M. R. Runyon in New York for Bridgeport Brass

Mefford R. Runyon has been appointed district sales manager for the New York metropolitan district for the Bridgeport Brass Company, Bridgeport, Conn. He was born and reared in New Jersey and educated at Rutgers as a chemical engineer. The World War called him overseas for a period of eighteen months, during which time he had complete charge of medical supplies for a large base hospital. He returned to Rutgers and after he was graduated he started in the wholesale hardware business. For four years following this experience he traveled as a public accountant in South America, Panama and West Indies. His metallurgical leaning again asserted itself and he took up the work of reorganizing the Benson Rolling Mills, one of the oldest brass and bronze manufacturing mills outside of Connecticut. In this work he was associated with Mr. Benson, an expert on phosphor bronze, and G. J. Marcy, formerly superintendent of the Rome Brass & Copper Company.

A.C.F.-International Harvester Working Agreement

Negotiations looking toward a general working agreement between the American Car & Foundry Motors Company and International Harvester Company have reached an advanced stage, according to newspaper reports. These claim an agreement has virtually been reached under which International Harvester will buy its truck engines from A.C.F. Officials of the latter refuse to comment on the proposition.

ELECTRIC RAILWAY MATERIAL PRICES—NOV. 16, 1926

Metals—New York

Copper, electrolytic, cents per lb.	13.875
Lead, cents per lb.	8.00
Nickel, cents per lb.	55.00
Zinc, cents per lb.	7.60
Tin, Straits, cents per lb.	71.00
Aluminum, 98 to 99 per cent, cents per lb.	27.00
Babbitt metal, warehouse, cents per lb.	
Commercial grade	64.00
General service	32.50

Bituminous Coal

Smokeless mine run, f.o.b. vessel, Hampton Roads	\$9.00
Somerset mine run, Boston	3.25
Pittsburgh mine run, Pittsburgh	2.75
Franklin, Ill., screenings, Chicago	1.875
Central, Ill., screenings, Chicago	1.725
Kansas screenings, Kansas City	2.35

Track Materials—Pittsburgh

Standard steel rails, gross ton	\$43.00
Railroad spikes, drive, Pittsburgh base, cents per lb.	2.90
Tie plates (flat type), cents per lb.	2.30
Angle bars, cents per lb.	2.75
Rail bolts and nuts, Pittsburgh base, cents lb.	4.20
Steel bars, cents per lb.	2.00
Ties, white oak, Chicago, 6 in. x 8 in. x 8 ft.	\$1.45

Hardware—Pittsburgh

Wire nails, base per keg	2.65
Sheet iron (24 gage), cents per lb.	3.00
Sheet iron, galvanized (24 gage), cents per lb.	3.85
Galvanized barbed wire, cents per lb.	3.35
Galvanized wire, ordinary, cents per lb.	2.50

Waste—New York

Waste, wool, cents per lb.	12-18
Waste, cotton (100 lb. bale), cents per lb.	
White	13-17.50
Colored	10-14

Paints, Putty and Glass—New York

Linseed oil (5 bbl. lots), cents per lb.	11.40
White lead in oil (100 lb. keg), cents per lb.	15.25
Turpentine (bbl. lots), per gal.	\$9.88
Car window glass, (single strength), first three brackets, A quality, discount	84.0%
Car window glass, (single strength), first three brackets, B quality, discount	86.0%
Car window glass, (double strength) all sizes, A quality, discount	85.0%
Putty, 100 lb. tins, cents per lb.	5.25-5.50
* Prices f.o.b. works, boxing charges extra.	

Wire—New York

Copper wire, cents per lb.	18.00
Rubber-covered wire, No. 14, per 1,000 ft.	\$6.00
Weatherproof wire base, cents per lb.	17.50

Paving Materials

Paving stone, granite, 5 in. New York—Grade 1, per thousand	\$147
Wood block paving 3 1/2, 16 lb. treatment, N. Y., per sq. yd.	\$2.70
Paving brick 3 1/2 x 4, N. Y., per 1,000 in carload lots	51.00
Paving brick 3 1/2 x 4 N. Y., per 1,000 in carload lots	45.00
Crushed stone, 1-in., carload lots, N. Y., per cu. yd.	1.94
Cement, Chicago consumers' net prices, without bags	2.10
Gravel, 1-in., cu. yd., f.o.b. N. Y.	1.75
Sand, cu. yd., f.o.b. N. Y.	1.00

Old Metals—New York and Chicago

Heavy copper, cents per lb.	11.50
Light copper, cents per lb.	9.50
Heavy brass, cents per lb.	7.00
Zinc, old scrap, cents per lb.	4.25
Lead, cents per lb. (heavy)	6.50
Steel car axles, Chicago, net ton	\$17.25
Cast iron car wheels, Chicago, gross ton	14.75
Rails (short), Chicago, gross ton	16.50
Rails (relaying), Chicago, gross ton	28.50
Machine turnings, Chicago, gross ton	6.75

President Alexander Legge of the Harvester company on Nov. 13 said:

"Our negotiations . . . have not progressed to the stage where any definite statements can be made. The most active discussion has centered around the proposition of using Hall-Scott motors in the heavier sizes of our trucks. . . . While other matters, such as the possible use of our service stations by buses and trucks manufactured by American Car & Foundry subsidiaries and co-operation in the motor business, have also been touched on they have not got beyond discussion. . . . Among other things we may arrange to round out bus orders by drawing from the bus subsidiary of American Car & Foundry."

Rolling Stock

Brooklyn City Railroad, Brooklyn, N. Y., it is understood, may be in the market soon for more cars, presumably of the front-entrance center-exit type.

San Diego Electric Railway, San Diego, Cal., received three street car type Fageol buses early in September. All of these units were equipped with air brakes.

Los Angeles Railway, Los Angeles, Cal., purchased two double-deck Fageol buses in September and two of the same type during the month of October.

Williamsport Traction Company, Williamsport, Pa., expects delivery in the near future of five light-weight one-man two-man safety cars, which are being built by the J. G. Brill Company, Philadelphia, Pa.

Boston & Worcester Street Railway, Framingham, Mass., has purchased five 29-passenger suburban Mack buses for operation between Framingham and Boston, a distance of 18 miles, and at a 50-cent fare. Fifteen trips daily will be made.

Detroit United Railway, Detroit, Mich., through its receiver, W. C. Dunbar, has been authorized to expend \$29,706 in the purchase of four new buses from Fageol. The buses are to be used in interurban passenger service, it was said.

Track and Line

Reading Transit Company, Reading, Pa., has been actively engaged in thermite welding defective rail joints on Ninth, Tenth and Penn Streets during the past six months. Four miles of track has been gone over and 300 joints welded without any service interruption.

Des Moines City Railway, Des Moines, Iowa, will start service on the Sevastopol line to Park Avenue on Dec. 1. The extension line will be about 3,700 ft. The improvement will cost the company approximately \$35,000.

Nashville Railway & Light Company, Nashville, Tenn., will complete shortly the laying of 1,600 ft. of rail to provide a double track on the Harding Road. The work will cost approximately \$20,000. Work has been started on the laying of double track rails from

a point near Craighead Avenue on the Harding Road, and extending west on Harding Road a distance of 1,600 ft. Laying of double tracks at this point is one of two steps taken by the company in improving service conditions on the West End line, it was pointed out. The company also is spending \$8,250 as its part in widening the overhead railway bridge on Harding Road, which will, in turn, make room for widening Harding Road at that point.

Power Houses, Shops and Buildings

Los Angeles Railway, Los Angeles, Cal., has installed in its main shops a new motor-generator set for arc-welding process. The apparatus consists of a General Electric 600-amp., 60-volt arc-welding set, with 750-amp. overload rating for one hour. This capacity is sufficient to take care of the intermittent load on two metallic circuits or one carbon circuit. It will, in addition, handle the necessary load requisite for the present automatic welding head in use for building up car wheel flanges. The increased amount of work to be handled by arc-welding methods at the South Park shops will be taken care of by this new arc-welding process.

Trade Notes

J. D. Elsom has resigned as vice-president of the Economy Electric Devices Company, Chicago, Ill.

J. R. Brandt has joined the Cleveland office of the Bridgeport Brass Company as raw materials salesman in the Pittsburgh territory and parts of Ohio. Before joining the Bridgeport Brass Company Mr. Brandt had experience with the United States Copper Products Corporation, Rome Hollow Wire & Tube Company and the Hennig Nickel Rolling Mills.

Robert J. Anderson, Inc., Cincinnati, Ohio, has been formed to operate as a commercial testing laboratory, specializing in metals and alloys. The new laboratory is fully equipped for chemical analysis, mechanical testing, metallography, heat treatment and radiography.

Rollway Bearing Company, Inc., Syracuse, N. Y., announces the appointment of John Parker as New England representative. Mr. Parker's engineering experience includes eleven years with Brown & Sharpe and more than fifteen years with three manufacturers of heavy equipment.

F. W. Stockmar has been appointed assistant general manager of the Railway Audit & Inspection Company, Philadelphia, Pa. Mr. Stockmar will make his headquarters in St. Louis, Mo., and will divide his time between that city, the general offices at Philadelphia and all of the district offices located throughout the United States. Mr. Stockmar became associated with the Railway Audit & Inspection Company during the war, first spending some time at Philadelphia as represen-

tative and later going to St. Louis in 1917. He was made district manager of the district office in that city in March of 1918.

Advertising Literature

Consolidated Car Heating Company, Albany, N. Y., has issued a new bulletin, No. 13-C, covering "Thermostatic Control for Electric Heaters."

Templeton, Kenly & Co., Ltd., Chicago, Ill., has announced a new line of Simplex trench braces in its bulletin No. 1126. These braces are of value in all types of underground construction where loose soil is encountered, and they have further applications in building and construction operations.

Westinghouse Electric & Manufacturing Company, East Pittsburgh, Pa., has published a descriptive leaflet, No. 29,297, covering the type TC-2 railway control and reset switch developed recently. This switch represents a new type of single-pole, double-throw magnetic blowout switch, so designed that it is more accessible and simpler in action than older type control switches, as well as being 50 per cent lighter. This switch is for use with either standard HL or K type control.

Portland Cement Association has emphasized the tremendous economic wastes suffered by industry each year through fire losses and recommends the more extensive use of concrete for industrial construction in a bulletin which it has just published. With this bulletin, entitled, "Half a Million a Year," is included a small leaflet telling what the Portland Cement Association is attempting to do, its organization, research work and similar data of interest.

Lincoln Electric Company, Cleveland, Ohio, has issued a booklet on automatic arc welding with Lincoln "Stable-Arc" automatics. Information on various types of automatic welding equipment to meet different service requirements is given.

International Motor Company, New York, N. Y., has issued catalog No. 95, a recent revised edition of 56 pages on the Mack buses, containing many illustrations and diagrams of the exclusive Mack features. A list of the factory branches is included in this pamphlet. The company has also published its first catalog, No. 61, on the Mack six-cylinder bus. It is described as a heavy-duty Mack chassis. "It is on the market to stay, not to satisfy a temporary craze," in the words of the booklet.

Railway Steel Spring Company, New York, N. Y., has published a 56-page catalog covering its springs for locomotive, passenger and freight car service, as well as special springs for many purposes. In addition the catalog contains a section on steel-tired wheels and one on locomotive and car wheel tires. In the back of the catalog are tables for reference in ordering equipment; circumference and area tables are also given, and various supplementary data are included.



Attention!

The splendor of the spread plumage of the Peacock naturally attracts admiring *attention*.

The striking appearance, luxury and comfort of the modern cars, also attracts and holds favorable *attention*. To achieve this result only the finest and best of materials, equipment and fittings can be utilized in their construction.

This is but one of the many reasons why most of the modern cars are equipped with

Peacock Staffless Brakes

If we have succeeded in attracting your *attention* to this advertisement, we can tell you that Peacock Staffless Brakes greatly improve the appearance of platforms of modern cars; that they are light in weight and occupy minimum platform space; that they have a chain winding capacity of 144 inches, enabling them to develop maximum braking power under all conditions. That there are many other factors which make Peacock Brakes especially adapted to modern car design.

That we will be glad to tell you about them and submit proofs that Peacock Brakes have performed all that is claimed for them.

National Brake Co., Inc.

890 Ellicott Sq., Buffalo, N. Y.

Canadian Representative:

Lyman Tube & Supply Company, Limited, Montreal, Canada



FISK TRANSPORTATION *"Fillerless"* CORDS

Fisk Supremacy Unchallenged

Representative bus lines throughout the country have chosen Fisk Transportation "Fillerless" Cords above all other tires because they give maximum mileage at the lowest cost per mile.

These great tires are not only remarkably economical but they guarantee extra comfort and safety under all conditions.

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Cane
Webbing
for Car Seats

No. 327-M—Special

Greater Comfort in This H-W Interurban Seat

Closer placement in cars and greater passenger comfort with increased leg room are outstanding features of this Heywood-Wakefield interurban car seat model. Mechanism rails are set in. The deep double spring cushions have chamfered edges. Individual backs are specially shaped and pitched to meet the best ideas of comfort without sacrifice of car room.

It is one of a series of new H-W Electric Car seat models equally suitable for either new cars or replacements.

Our car seating experts will be glad to help you decide on the best seating equipment for your needs. This service is free through any H-W Sales Office.

Heywood-Wakefield
REG. U.S. PAT. OFF.

HEYWOOD-WAKEFIELD SALES OFFICES

Heywood-Wakefield Company, Wakefield, Mass.

Heywood-Wakefield Company,
516 West 34th St., New York, N. Y.

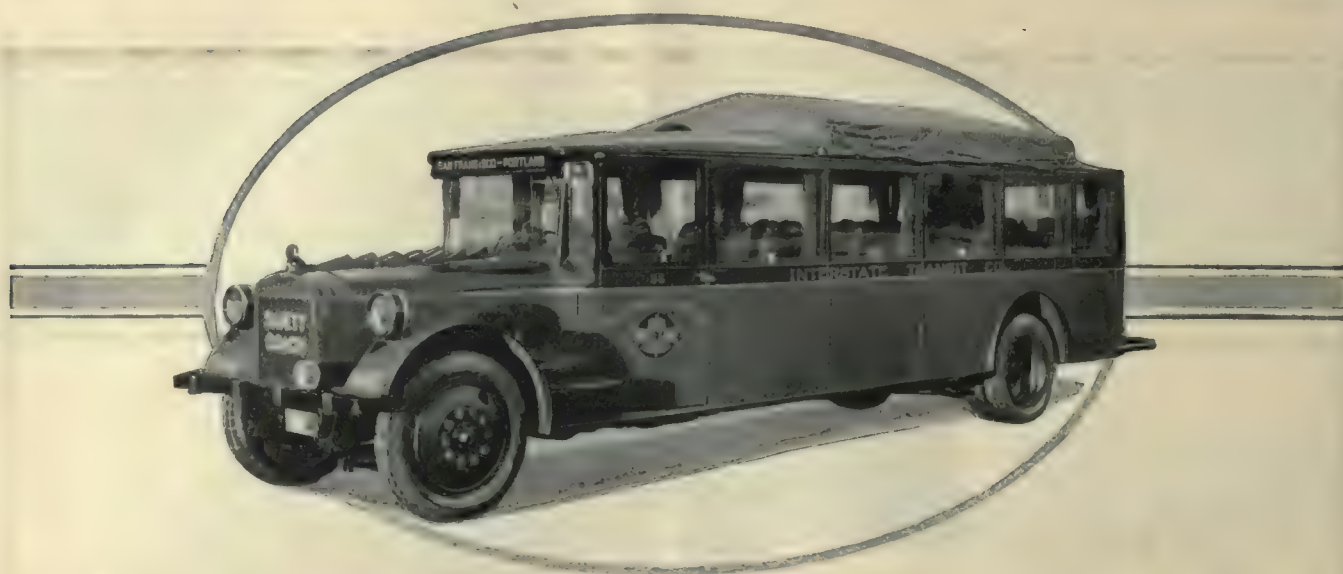
Herbert G. Cook,
Hobart Bldg., San Francisco, Cal.

The G. F. Cottor Supply Co.,
Houston, Texas

Heywood-Wakefield Company,
439 Railway Exchange Bldg., Chicago, Ill.

Frank N. Grigg,
630 Louisiana Ave., Washington, D. C.

Railway & Power Engineering Corporation,
133 Eastern Ave., Toronto;
Montreal; Winnipeg, Canada



San Francisco to Portland In 32 hours on Generals!

It's easy enough to understand why The General Tire is such a top-heavy favorite with big fleet operators everywhere when you know the experience of those operators with The General Tire.

Take the case of the Interstate Transit Company, operating a fleet of De Luxe Parlor Car busses between San Francisco, California, and Portland, Oregon.

One hundred and seventy-eight miles of hard travel lie between these two Western cities. Snow, ice and California sunshine are all encountered on the long grind. Two mountain ranges must be crossed on each trip.

The entire trip must be made in 32 hours—532 miles of it the first day. And each bus in the Interstate fleet must maintain this rigid schedule—day in and day out—from the year's beginning to its end.

Surely a real test of tires! Any that can stand up for any length of time in such

grueling service must have the right kind of stuff in every inch of it. It was for this reason that Interstate officials equipped these big busses with the most durable tires money will buy—Generals.

And now, after 22,000 miles of trouble-free service, many of these big Interstate busses are still running on their original rubber. Their power and gasoline consumption is remarkably low, thanks to the lower rolling-resistance of The General Tire. Operating costs have been brought down to the lowest possible figure.

Talk to the General dealer in your community. He will be glad to show you how other fleet operators are profiting from 100% General Tire equipment. And—he has a plan that permits you to change to Generals now without sacrificing the unused mileage in your present tires.

The Mark
of Leading
Tire Stores
Everywhere



The

GENERAL TIRE

—goes a long way to make friends

BUILT IN AKRON, OHIO, BY THE GENERAL TIRE AND RUBBER CO.



ABOVE: Paul Steinbach, International de luxe coach operator of Albany, N. Y., reports an unprecedented public demand for the riding qualities and luxurious appointments of the type of coach illustrated, in the face of other keen bids for popularity.

INTERNATIONAL HARVESTER 6-cylinder Coaches



The perfectly balanced 15-passenger International Coach developed to cover the vast field where this type and capacity meet all needs. Chassis and body quality-built in every detail, economy of operation and maintenance assured.

THE International Harvester line of motor coaches provides the operator with his choice of equipment. He can fit coach to route in the most profitable manner. He can carry 15 to 30 passengers, using the Parlor-Club Coach for cross-country travel, the Street Car Type Coach for city service, or the Sedan, which is ideal for its special field. And he is given every opportunity to please his public via the supreme comforts, the safety features, and the de luxe appointments that Internationals offer. Service will always be close at the hand of the International coach owner, rendered through the world's largest Company-owned truck and coach service organization. International has 121 branches in the United States and 17 in Canada.

BELOW: Part of International coach fleet of the Interstate Transit Company, operating out of Omaha, Sioux City, and other cities.

INTERNATIONAL HARVESTER COMPANY
606 So. Michigan Ave. of America Chicago, Illinois
(Incorporated)





Two average-sized men have a rather uncomfortable time of it in an ordinary double seat, as is apparent in the view above.



The "overlap" of shoulders in the Karpen "Staggard" Seat gives several inches extra room, and permits fully as much comfort and privacy as two individual seats

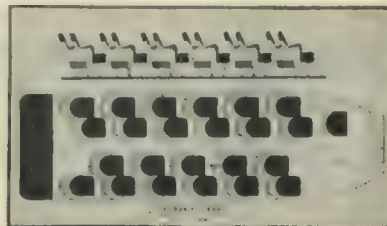


Now you can see the advantage of Karpen "Staggard" Seats

The Karpen "Staggard" Seating method is the only arrangement which gives the comfort and privacy so much appreciated by bus riders, without reducing the seating capacity of the bus. Overlapping the shoulders of the two passengers not only furnishes greater comfort than is possible with an ordinary double chair, but a "Staggard" Seat occupies less actual space. Four inches are added to the aisle width, and, what is more important, the alternate placing of seats along the aisle gives a still greater usable aisle space than with opposite placing.

The floor plan below makes this point clear.

Karpen's experience of over thirty years in building de luxe seating for America's finest railroad service and careful study of bus operation have made possible the Karpen "Staggard" Seat.



(Patents Pending)

Remember that all Karpen coach chairs are built of indestructible fiber, with steel reinforcement in every upright stake, and genuine leather seats, cushions and backs. Climate and temperature have no effect on such construction. For quality and comfort in transportation seating always go to Karpen.

Karpen

FURNITURE

S. KARPEN & BROS.

General Offices, 636-678 West 22nd Street

CHICAGO

San Francisco Salesroom
180 New Montgomery Street

New York Salesroom
37th Street and Broadway

Chicago Salesroom
801-811 So. Wabash Avenue



*A new 21-Passenger Baker-Raulang Bus Body for chassis of approximately 180" wheelbase.
Interior fitted for either City Pay-enter or Parlor Coach service.*

A Complete Line Complete Service Complete Experience

BAKER-RAULANG
BUS BODIES are
made in various sizes
and styles to exactly
fit the need of every
service.

Attractive appearance, riding comfort, low maintenance cost, standardized parts are a few of the many superior features of these bodies.

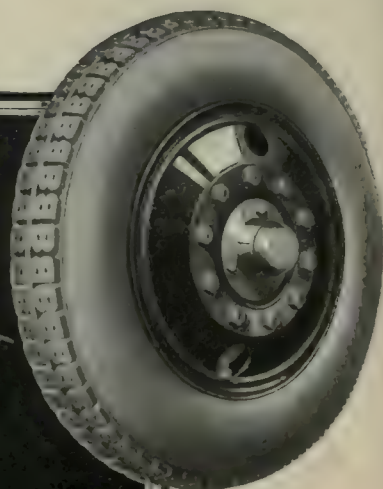
Large scale manufacturing facilities coupled with a complete engineering and sales service assure a dependable source of supply which cannot be equaled by smaller or less experienced body builders.

Our new catalog No. 201, containing valuable bus body information, will be sent upon request.

THE BAKER-RAULANG COMPANY • Bus Body Division • CLEVELAND, OHIO



Again...the bus show was held on Budd-Michelin Dual Wheels



A true picture of wheel equipment has again been shown—at Cleveland. Buses everywhere are on Budd-Michelin Wheels. A giant industry with 200,000 men depending on the operation of 40,000 buses as a means of living, refuses to gamble.



BUDD

WHEEL COMPANY

Detroit

Harley-Davidson "Single" with "Ricardo Head" Breaks World's Record



Ricardo Heads Put Miles in Gasoline

High power and unusual economy distinguished the American Motorcycle Ass'n Sanctioned Performance of the Harley-Davidson "Single" during a recent seven-day non-stop reliability run. An average of **124.8 MILES PER GALLON** was obtained during the seven days. This wonderful performance is attributed to the "Ricardo Head" used. In proportion to their size Waukesha Bus and Truck Engines, which have been equipped with "Ricardo Heads" for over three years, give equal economy and power.

Power without "Ping" is another feature of all Waukesha "Ricardo Head" Engines. Write for "Six Cylinder Booklets" describing both large and small Bus and Truck Engines which are built in five sizes from 75 to 125 H. P.

AUTOMOTIVE EQUIPMENT DIVISION

WAUKESHA MOTOR COMPANY
Waukesha Wisconsin

Eastern Sales Offices

Aeolian Building, 33 W. 42nd Street

New York City

Exclusive Builders of Heavy Duty Automotive Type Engines for Over Twenty years

Luxurious Comfort

This is an age of comfort—recognized by Studebaker in designing busses!

THE American public today demands the utmost comfort in every mode of transportation. Excess fare trains, solid pullmans, parlor cars on interurban runs—all evidence this tendency for comfort.

It is equally true that marked preference is shown by bus patrons for vehicles possessing easy riding qualities and attractive appearance.

In recognition of this tendency on the part of the riding public, Studebaker has paid special attention to comfort in the development of its bus designs.

ONE of the reasons why experienced bus operators are standardizing on Studebaker equipment is the superlative riding qualities they give. With the most powerful bus chassis of its size and weight, Studebaker busses glide quietly along the highway with a smoothness alone attainable by an accurately balanced six-cylinder power plant in which vibration is practically eliminated. The long resilient springs and full balloon tires cushion every road shock while the smooth-acting four-wheel hydraulic brakes enable the operator to drive at permitted speeds with reassuring safety.

Bus patrons gravitate toward Studebaker busses because all Studebaker busses have deep upholstered seats, generous leg room and wide-vision windows.

Geo. Basle, Treasurer and General Manager of the White Star Lines of Washington, Pa., writes: "On every trip passengers comment on the comfort and convenience of our Studebaker busses—we standardize on Studebaker busses because they are the kind of busses the public prefers to use—a trial ride means a new customer, because he experiences a riding comfort seldom found in bus transportation." Such is the evidence of Studebaker superiority in the bus field, written by a man who knows the business-getting value of comfortable equipment.

Parlor Car Comfort

Comfort is attained to a remarkable degree in the Studebaker 18-passenger side-entrance parlor car, shown on the opposite page.

Big high-backed wicker chairs, upholstered in genuine leather, seat 18 passengers, including driver, in luxurious comfort. The space from seat back to seat back measures 32½ inches, thereby providing more than the usual amount of leg room. Head room is liberal, the distance from the floor to ceiling being 53½ inches.

Four doors, each measuring 31¾ inches wide, provide convenient entrance and exit for passengers on the right side. There is a separate door on the left side for the driver, and an additional door for emergency use.

The body is 198 inches in length and 76 inches in width. Framework is selected hardwood. Finish is rich, durable lacquer in a choice of two color combinations.

Appearance and comfort enhanced by such details as draped window curtains; six dome lights; broad windows which are easily lowered or raised; and six ventilators, three of which are located in the roof, two at the top of the windshield and one in the cowl. A heating system runs from the exhaust.

Space for storing baggage is provided back of the fourth tier of seats. This space is railed and sits well forward, so as not to interfere with passengers in the back tier of seats. There is ample room for small parcels under each seat, and additional accommodation for luggage in the railed area on the roof. The railing is optional.

Equipment is complete and includes: stop signal system; illuminated destination sign (above windshield); automatic windshield cleaner; rear-view mirror; front and rear bumpers; motometer; extra

L
—first cost
—operating cost
—maintenance cost
—depreciation cost
Lower

STUDEBAKER

For Long Routes



\$5300

f.o.b. Factory

The Studebaker Side-Entrance Parlor Car for Eighteen Passengers

wheel with tire, tube and cover mounted on left front; 8-day clock and gasoline gauge, plus the usual instruments, mounted in an oval group under glass; inspection lamp with 10-foot cord. Lights are controlled by a steering wheel switch.

Most Powerful Bus Chassis of Its Size and Weight

Based on the rating of the Society of Automotive Engineers, the Studebaker bus chassis is the most powerful of its size and weight in the world. There are 66 bus chassis on the market with more weight per horse power than Studebaker.

The chassis is sturdily built, with surplus strength. It is not a heavy truck-type chassis—nor a passenger car chassis which has been

lengthened and therefore weakened by splicing. Extra safety factors include: staunch frame, braced by eight stout cross-members; large rear axle shaft; oversize propeller shaft; sturdy, resilient springs; special disc steel wheels and four-wheel hydraulic brakes.

Typical of the many engineering refinements of the chassis are: the crankshaft which is fully machined, thereby reducing vibration to a minimum; ball-bearing steady rest, holding propeller shaft in rigid alignment; tapered roller bearings; oil filter and air cleaner; water-proof ignition system.

As proved by more than 200 Studebaker busses with records of more than 100,000 miles, this chassis gives literally scores of thousands of miles of thoroughly dependable service at exceptionally low operating cost—and minimum depreciation.

Six Body Designs, 12 to 21 Passengers, \$3935 to \$6150

Prices f. o. b. factory, covering body and chassis, complete. Purchase can be arranged on a liberal Budget Payment Plan—Small down payment and balance in convenient monthly installments.

12-Pass. (including driver) cross-seat Sedan-Type	\$3935
15-Pass. (including driver) cross-seat Sedan-Type	\$4295
19-Pass. (including driver) cross-seat Sedan-Type	\$5050
21-Pass. Pay-As-You-Enter Street-Car Type*	\$5125
18-Pass. (including driver) side-entrance Parlor Car	\$5300
20-Pass. (including driver) Parlor-Car De Luxe*	\$6150

*Includes dual rear wheels

THE STUDEBAKER CORPORATION OF AMERICA,
Dept. B South Bend, Ind.

Send me full information on Studebaker Busses without obligation

Name

Address

City State

We have busses at present.

Check below the Studebaker Bus about which you desire information.

Type: Sedan Parlor Car Street-Car Type

Capacity: Passengers.

BUSSES

MORE PROFIT PER PASSENGER MILE



Master Ball Bearings

THE PURCHASE PRICE of a Ball Bearing represents only a small percentage of the total cost chargeable to making a Bearing Replacement. An extra measure of **STAMINA^{AND}DEPENDABILITY** in the Ball Bearings used in your equipment is certain to result in Greatly Reduced Maintenance Costs. *****

Ahlberg Bearing Company

317-327 East 29 St. Chicago, Illinois
Available at our 33 direct factory branches

Akron
Atlanta
Baltimore
Boston
Brooklyn
Chicago
Cincinnati

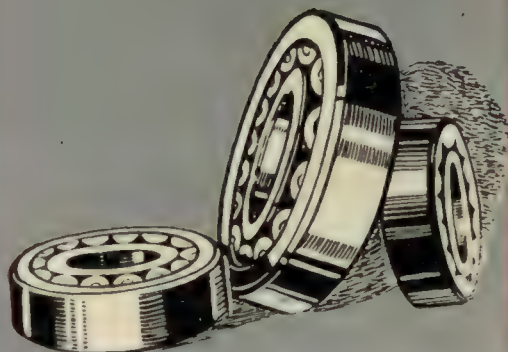
Cleveland
Columbus
Dallas
Denver
Detroit
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Branches

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New Orleans
New York
Oakland

Omaha
Philadelphia
Pittsburgh
Portland, Ore.
Providence
San Francisco

Seattle
St. Louis
St. Paul
Toledo
Washington
Youngstown



Ahlberg Ground Bearings

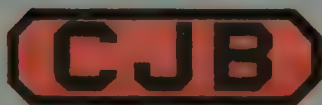
The simple, practical and most economical thing to do is to replace worn bearings with Ahlberg Ground Bearings.

You can exchange your old bearings for Ahlberg Ground Bearings at an Ahlberg station near you. They will cost you about 1/3 less. There is an Ahlberg Ground Bearing for every bus requirement.

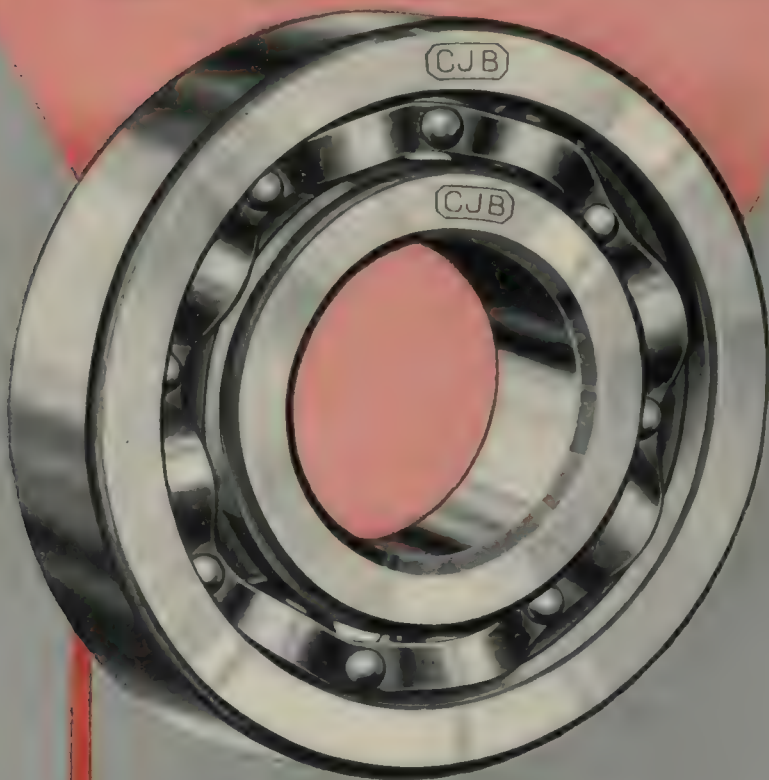


This mark means Ahlberg Ground

Design
Material
Workmanship



This mark identifies the closest approach yet made to Ball Bearing Perfection





Typical H-K Types —for both bus and car

Get our catalog for complete particulars



**No. 208
Bus Seat**

De Luxe type with divided back, spring cushion and air cushion pads.



**No. 199-F
Car Seat**

Special design, plush seat with thickly upholstered spring edge cushion and detachable back.



**No. 901
Bus Seat**

Graceful, comfortable double chair model with divided back and spring cushion pads.

**No. 392-EE
Car Seat**

Finest type, interurban car seat with extra high three-part head-roll and mahogany capped arm-rest.



HALE-KILBURN COMPANY

General Offices and Works:

**1800 Lehigh Avenue,
PHILADELPHIA, PA.**

SALES OFFICES:

Hale-Kilburn Co., 30 Church St., New York
Hale-Kilburn Co., McCormick Bldg., Chicago
E. A. Thornwell, Candler Bldg., Atlanta
Frank F. Bodler, 903 Monadnock Bldg.,
San Francisco
Chris Eccles, 320 S. San Pedro St., Los Angeles

T. C. Coleman & Son, Starks Bldg., Louisville
W. L. Jefferies, Jr., Mutual Bldg., Richmond
W. D. Jenkins, Praetorian Bldg., Dallas, Texas
W. D. Jenkins, Carter Bldg., Houston, Texas
H. M. Euler, 45 Front St., Portland, Oregon

Hale and Kilburn SEATS

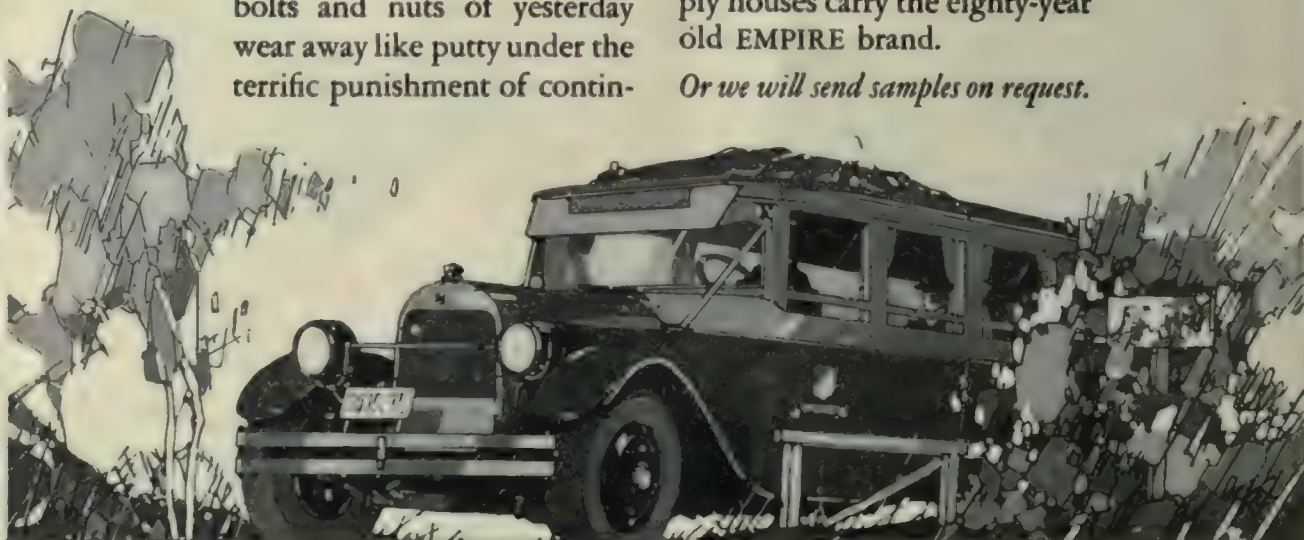
EMPIRE BOLTS & NUTS

BUS transportation has developed a new problem in maintenance—the rapid wear of parts that in ordinary automotive service were good enough. The "good enough" bolts and nuts of yesterday wear away like putty under the terrific punishment of contin-

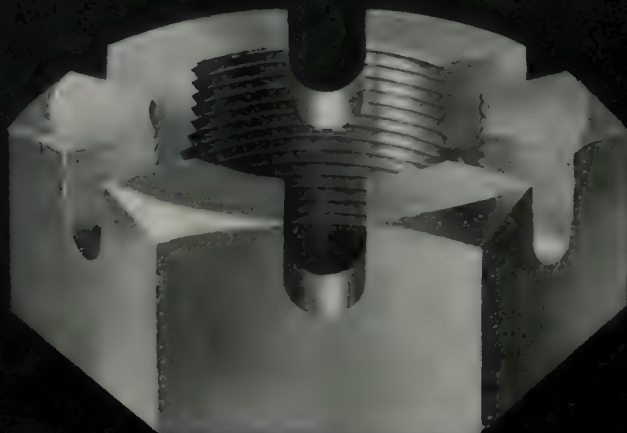
uous high speed bus service. Specify EMPIRE Bolts and Nuts in all your shops. The difference in overhaul time will interest you.

All good jobbers and mill supply houses carry the eighty-year old EMPIRE brand.

Or we will send samples on request.



PRECISION
OF FIT
•
STRENGTH
OF
THREAD



ACCURACY
OF
FINISH
•
PERFECT
HEX

RUSSELL, BURDSALL & WARD
• **BOLT & NUT COMPANY** •
PORT CHESTER, N.Y.



Branch Office:
Sears Building
CHICAGO

Branch Office:
General Motors Bldg.
DETROIT

Branch
Factory:
ROCK FALLS, ILL.

Branch & Collect
209 Jackson Street
SEATTLE

Maydwell & Hartnell, Inc.
152-168 Eleventh Street
SAN FRANCISCO

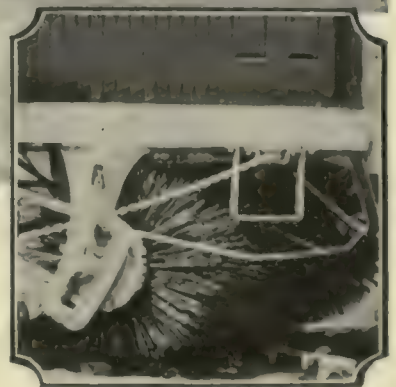


Makers of Bolts, Nuts, and Rivets Since 1846

Keep the roadway **CLEAR**



Broom Lifting Mechanism



Roller-Bar Drive Chain

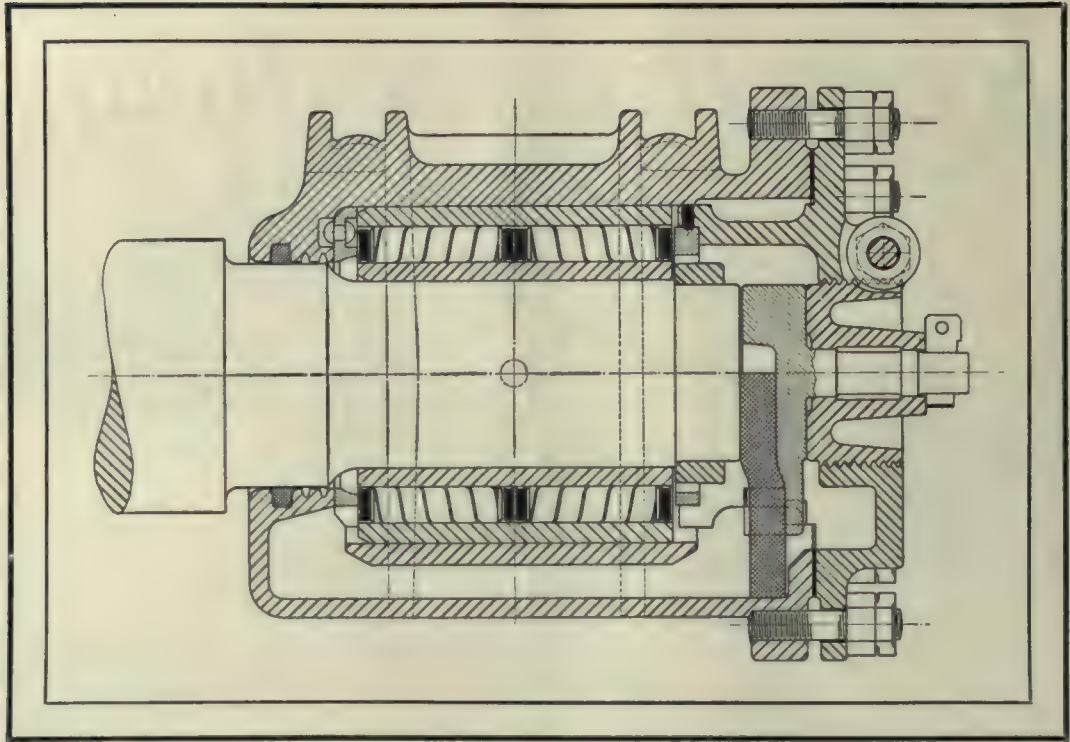
Blocked cars collect no fares

Hundreds of railways located in the heavy snow belt rely on Cummings Snow Sweepers to keep the rails clear, and maintain schedules during the season when the public depends most upon street railway service. The long broom clears both rails and fifteen inches additional outside of each track. The case hardened roller bar, and detachable link steel chain drive make for long life and low maintenance. Brooms can be lifted to clear unusual obstacles.

CUMMINGS CAR AND COACH CO.

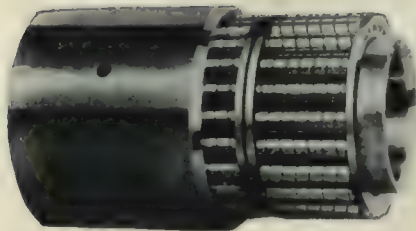
Successor to McGuire Cummings Mfg. Co.

111 W. Monroe St., Chicago, Ill.



Modern truck design includes Hyatt bearings

OBSOLETE IDEAS concerning trucks are just as much a drag on the industry as is out-of-date thinking about car bodies and motor equipment. Trucks with plain bearings are wasting millions of kilowatt hours annually, struggling to overcome a friction load as unnecessary as surplus weight.



Hyatt Roller Bearings meet every A.E.R.A. requirement. They carry full standard loads in boxes which fit all standard trucks without change.

Plans and specifications are now available for your use, covering Hyatt Roller Bearing applications for every type of service. This equipment meets every A.E.R.A. requirement for standard equipment.

HYATT ROLLER BEARING COMPANY

NEWARK, N. J.

The Canadian Fairbanks-Morse Co., Ltd., Agents for Hyatt Roller Bearings through Canada.

HYATT

QUIET ROLLER BEARINGS



Increased Revenue

The new "modern car" idea has taken hold throughout the industry, but to Grand Rapids belongs the credit of being the first to adopt the outstanding innovations which characterize the modern car. Among these new features, attention is called particularly to the stream line painting scheme, flood light on the dash, skirt hiding the wheels and reducing noise, and the cabinet enclosing control mechanism.

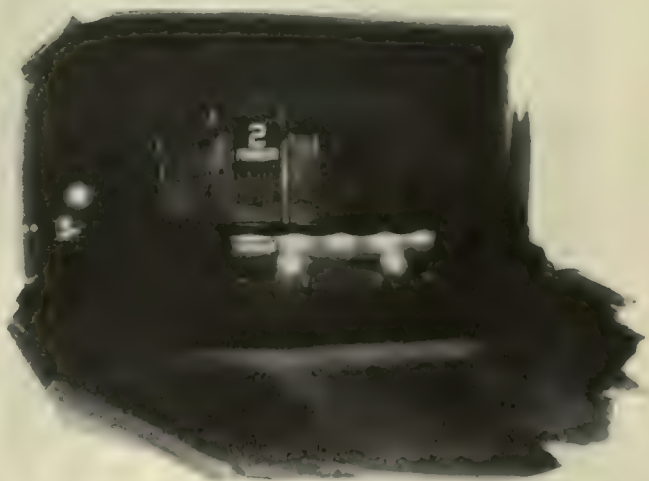
Improved appearance and improved comfort have produced immediate results in increased riding and better public relations. Beyond a doubt, *new modern cars pay.*

The Grand Rapids Cars Are

Quality Cars

Reduced Operating Expense

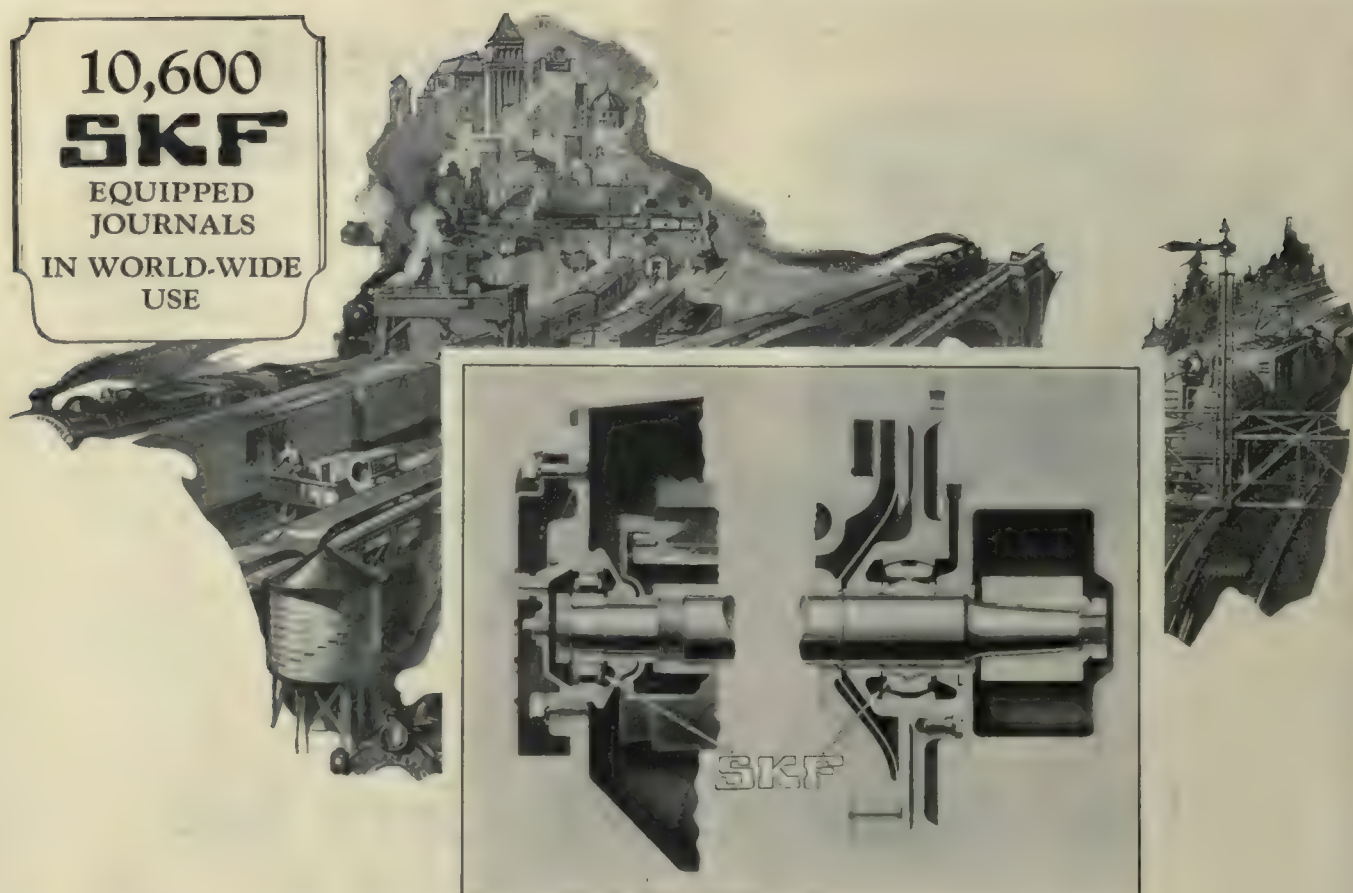
A second advantage of modern cars, such as the type now standard in Grand Rapids, is reduction in operating costs. Operation expenses include power consumption, which has been reduced from 3.5 KWH to 1. KWH per car mile. Platform expense has been reduced by the one-man method of operating, and maintenance has dropped from two and a fraction cents per car mile, to less than seven tenths of a cent. Beyond a doubt, *Modern Cars Pay!*



St. Louis Car Company
St. Louis, Mo.

"The Birthplace of the Safety Car"

10,600
SKF
 EQUIPPED
 JOURNALS
 IN WORLD-WIDE
 USE



Keep Rolling Stock Profits Up With **SKF** Anti-Friction Bearings

Send for
**SPECIAL
 RAILWAY
 BULLETIN**
 and
 Surveys of
 Miscellaneous
 Industries

KEEPING cars out on the rails earning profits instead of liabilities in the shops calls for equipment which will render the most miles per dollar invested. **SKF** marked anti-friction bearings, because of their long-life and freedom from constant maintenance, amply fulfill this requirement.

On the typical railway motor application, shown above, **SKF** marked anti-friction bearings easily sustain the severe shock loads imposed. Stray currents are better taken care of due to the greater area of contact on these bearings. They require no adjustments. Suitable protection is provided against the intrusion of dirt.

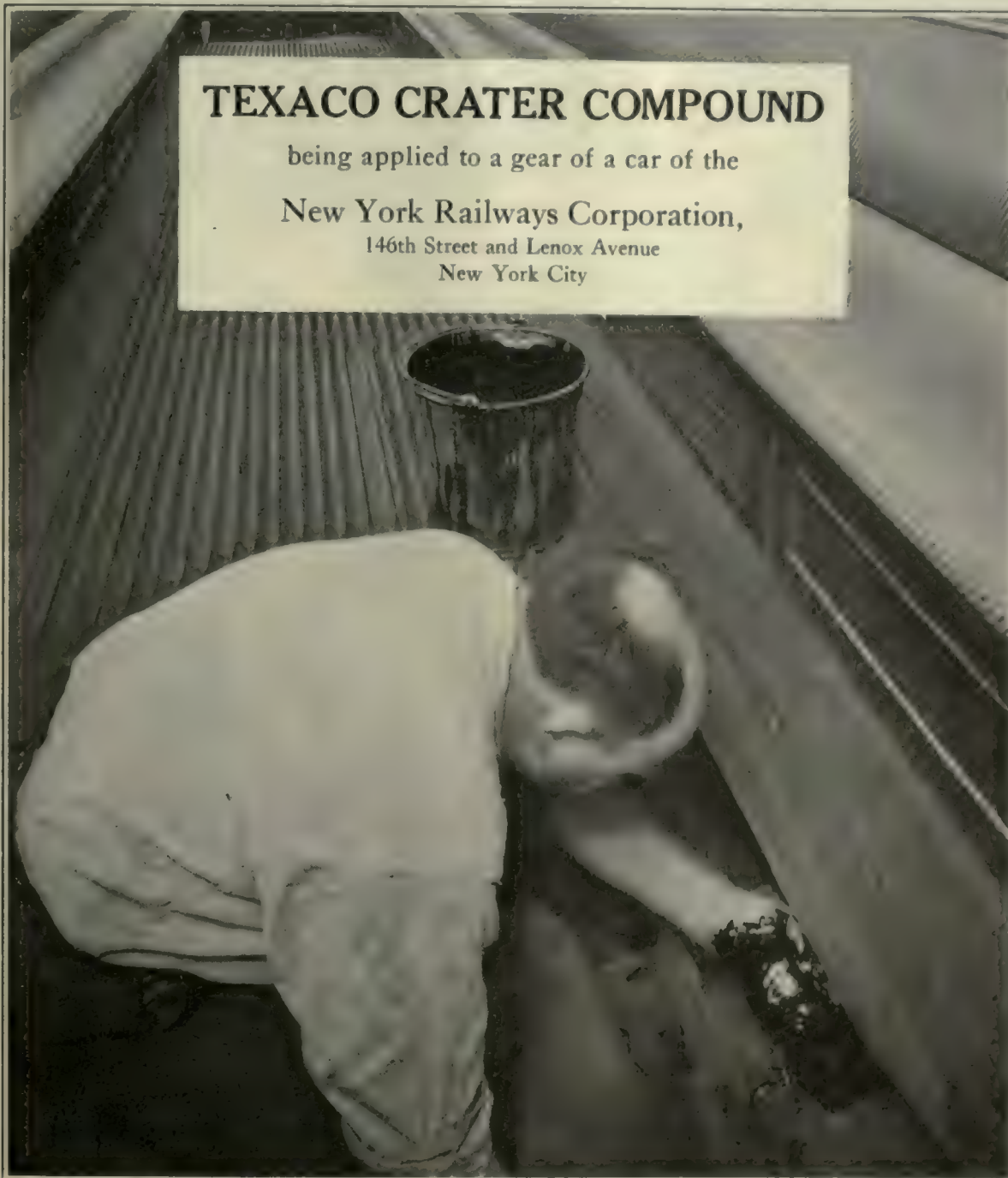
SKF INDUSTRIES, INCORPORATED
 165 Broadway, New York City

1611



TEXACO CRATER COMPOUND

being applied to a gear of a car of the
New York Railways Corporation,
146th Street and Lenox Avenue
New York City



TEXACO



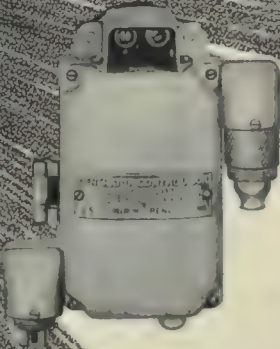
The Chosen Lubricant
of ELECTRIC RAILWAYS



The Texas Company, U. S. A., 17 Battery Place, New York City
OFFICES IN PRINCIPAL CITIES

LIGHT!

*In the
darkness
of battery trouble*



THIS DEVICE—the regulation part of Leece-Neville Patented Voltage Regulated Electrical System sheds real light on the dark and troubled field of battery maintenance.

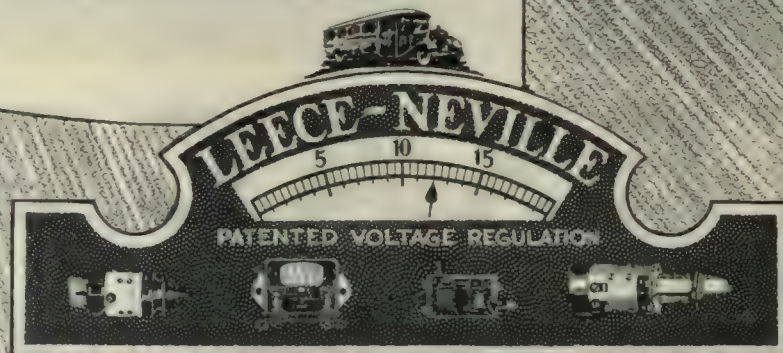
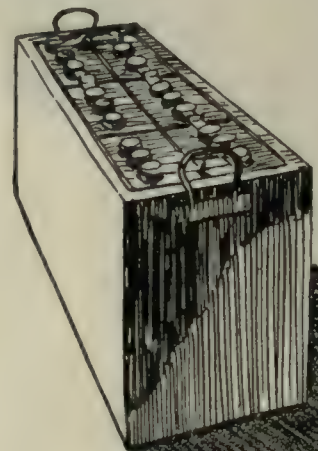
It regulates the generator charging rate to the condition of the battery—the battery cannot be overcharged—and is kept in excellent condition.

These improvements over ordinary conditions cure most battery troubles and the batteries last several times as long.

Leading bus builders either install Leece-Neville Patented Equipment, or provide for its optional installation.

See that your specifications cover it.

Leece-Neville Company
5353 Hamilton Ave., Cleveland, Ohio





*No bus is a success
unless it is filled with
comfortable passengers*

Comfortable passengers help
build comfortable margins of
profit. The attractive body
draws everybody. Lang not
only knows how to build
bodies but how to fill them.

LANG BODIES

create new passengers



Comfortable seats, luxuriously upholstered, invite relaxation. Wide windows permit clear vision. Drapes, panel mirrors and other details of refinement lend an air of intimacy that makes friends for the bus—and keeps them.

A Lang Body assures a friendly bus.

THE LANG BODY COMPANY
CLEVELAND, OHIO

*"After all—
it's the Setting
that counts!"*



Rolled Steel Wheels
Quenched and Tempered
Carbon Steel Axles
Coil and Elliptic Springs
Armature Shafts

THE Indiana Service Corporation's motor car and parlor chair buffet car, illustrated above, are equipped with "STANDARD" Rolled Steel Wheels and Quenched and Tempered Axles.

STANDARD STEEL

WORKS COMPANY

PHILADELPHIA, PA.

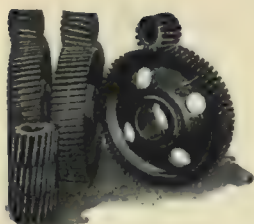
BRANCH OFFICES:

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HOUSTON, TEXAS
PORTLAND, ORE.
RICHMOND, VA.

SAN FRANCISCO
ST. PAUL, MINN.
PITTSBURGH, PA.

WORKS: BURNHAM, PA.



$8\frac{1}{3}c.$ vs. $11\frac{1}{2}c.$

Per 1,000 car miles for pinion costs!

The Superintendent
of Equipment on a
well-known property
reported:

"We ran very careful tests of 'Tool Steel' Pinions vs. Special Quenched Pinions, following our tests with micrometer measurements and figured our cost per 1,000 car miles based on the relative cost and relative life of the two grades. The 'Tool Steel' showed $8\frac{1}{3}c.$ while the competitive grade was $11\frac{1}{2}c.$ This accounts for the fact that we have bought so many 'Tool Steel' gears and pinions since that time.

"I might say that we have since been following these tests and the opinions which we formed when the tests were conducted are working out very close to our predictions."

It is the ultimate cost and not
the first cost that really counts



The Tool Steel Gear & Pinion Company
Cincinnati, Ohio

The Standard of Quality

TOOL-STEEL QUALITY
GEARS AND PINIONS



STRENGTH



2¢6
The International
Dating Nail

AUTHENTIC statistics show yellow pine as highest in breaking, impact and crushing strength. This great strength is lasting. Properly creosoted pine poles, and *International* poles are properly creosoted, retain their original strength and are as strong after years of service as when installed.

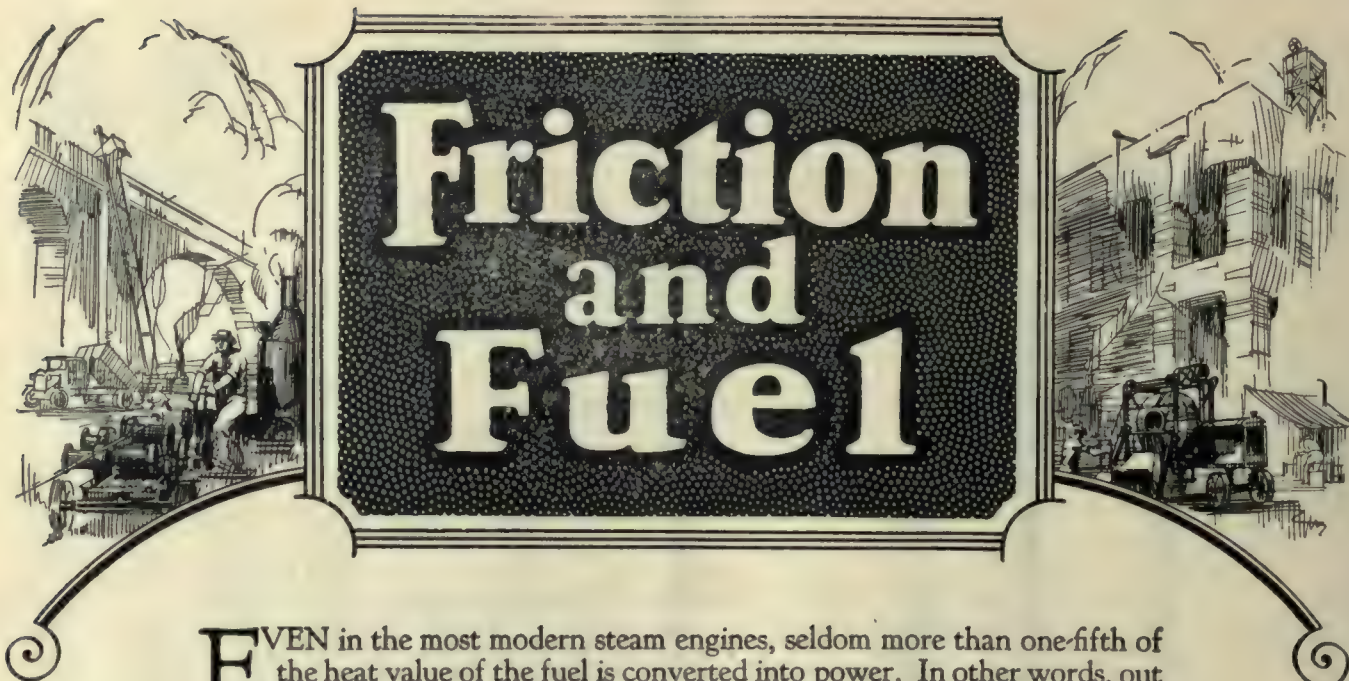
Public utility officials find that these poles combine greatest strength and greatest durability. They have learned that lines built of creosoted pine poles give the most reliable service the year round, and the lowest annual cost.

When the extreme test comes during raging storms, these poles stand up under the strains that prove so disastrous to other poles.

Illustration shows International poles between Pueblo and Canon City in service of the Southern Colorado Power Co.

International Creosoting & Construction Co.
Galveston—Texarkana—Beaumont

International Creosoted Yellow Pine Poles



EVEN in the most modern steam engines, seldom more than one-fifth of the heat value of the fuel is converted into power. In other words, out of every five tons of fuel used, only one ton actually produces power that turns your machinery. A considerable loss occurs in converting water to steam in the boiler. Another large loss is caused by the discharge of exhaust steam, even when efficient condensers are used. In addition to these are the losses due to radiation of heat and due to friction.

An overall efficiency of twenty per cent presupposes practically perfect lubrication. With every increase in friction, whether in the driven machinery or in the steam engine itself, the percentage of power that is available for work is decreased. More fuel must be burned to overcome this friction in order to produce the same amount of available power.

To secure the largest possible percentage of work from the fuel you burn, it is necessary that your machinery—both engines and driven machinery—be lubricated with oils and greases that exactly suit their requirements and reduce friction to a minimum.

Standard Oils and Greases

are lubricants of the highest quality, and are made in grades to suit the requirements of all machinery now used in the industrial world.

Standardize on Standard Oils and Greases and you will save fuel, reduce depreciation and repair expense, and get more power.

STANDARD OIL COMPANY
(INDIANA)

910 South Michigan Avenue

Chicago, Illinois





Do Your Trolley Poles Crack at the Butts?

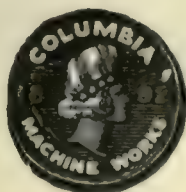
That is just where Columbia Poles are reinforced—at points where the strain is greatest.

Columbia Poles are built to meet two essential requirements—lightness and strength. The weight is kept to a minimum. The strength is greatly increased by reinforcements, not only at the base but inside, giving the pole resistance against blows and strains throughout its entire length.

Our poles are made in the butt-weld type and are supplied in lengths from eleven to sixteen feet.

Columbia Harps are built with the same care which is given to the construction of the poles. They are sold individually, with poles, or complete with wheels and axles, ready for installation.

May we quote you prices on poles and harps or on any other Columbia Products?



The

COLUMBIA MACHINE WORKS & M. I. CO.

RAILWAY SUPPLIES and EQUIPMENT

Machine and Sheet Metal Work, Machinery, Grey Iron and
Brass Castings, Patterns, Forgings, Armature and Field Coils

265 Chestnut St., corner Atlantic Ave.

Brooklyn, N. Y.



Brushes That Fit

Unless the brushes of car motors fit snugly and accurately and are of the right grade there will be excessive sparking. Decreased operating efficiency and heavy repair bills are the result.

The brushes should be correct in size, shape and quality of material. We build U. S. G. Brushes to meet exactly every requirement.

Write for the brush catalog



The United States Graphite Co.
Saginaw, Mich.

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Chicago

Philadelphia
St. Louis

Pittsburgh
San Francisco

Motor and Generator
BRUSHES

Nuttall



The new

Nuttall Form US 20A

Timken Roller Bearing Trolley Base

A really new trolley base, simplified and engineered to the same high standards of efficiency and low maintenance as the modern car motor. Incorporates the famous Timken Roller Bearing — a tapered double-race roller bearing designed by this manufacturer especially for trolley base service.

Profitably interesting features include extreme sensitiveness, with swiveling strains evenly distributed on bearings; oil and grease reservoirs for lubrication of bearings and pole socket axle pin respectively; quick, easy lubrication only once in six months.

Full specifications on request.



1926

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PITTSBURGH  PENNSYLVANIA

All Westinghouse Electric & Mfg. Co. District Offices are Sales Representatives in the United States for the Nuttall Electric Railway and Mine Haulage Products. In Canada: Lyman Tube & Supply Co., Ltd., Montreal and Toronto.



York Railways City Car
built by
V. G. Brill Co.

HASKELITE Roofs PLYMETL Sides

No body maintenance in two years

"These cars have been in operation since the latter part of 1924 and the only maintenance required has been the renewal of steel wheels."

Liked by the traveling public

"The cars are giving excellent service in every way and are very much liked by the traveling public."

This is a typical example of the service rendered by HASKELITE and PLYMETL on leading electric railway properties throughout the country. May we send you a list of representative users and details of street car and bus applications?



Haskelite Manufacturing Corp.

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Canadian Representatives:

Railway and Power Engineering Corporation, Ltd.
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ERJ 11-260ay




For the Best in Track Work

Forty-five years
experience and
the best of mod-
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*Send Us
Your
Inquiries*

THE BUDA CO.
Harvey, Ill.



A Dayton Tie Every 20 Seconds

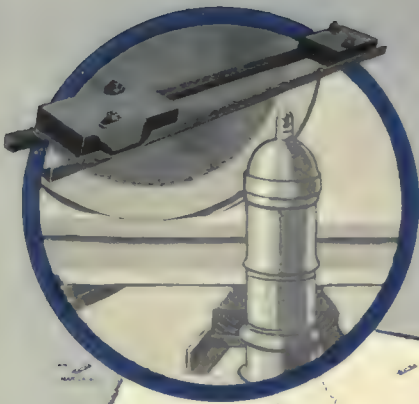
EVERY TIME your watch ticks off 20 seconds, another Dayton Mechanical Tie has been made.

The Dayton Tie plant in Dayton, Ohio, doubled in capacity recently, is working full blast night and day to keep up with the stream of orders from grateful railway properties — grateful because we have solved for them the old track problem.

We started making Dayton Mechanical Ties 15 years ago. Track laid on the first ones is today in virtually new track condition, still defying heaviest traffic.

In all the hundreds of Dayton Tie Installations, not one penny of maintenance has ever been directly or indirectly traceable to the Ties.

**The Dayton Mechanical Tie Co.,
Dayton, Ohio.**



*Every Blue Tie,—
a Dayton Installation*



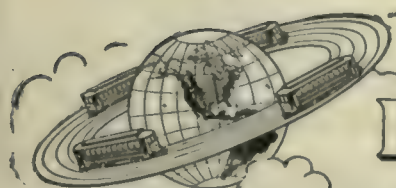
This Map Is Getting Crowded

It has us humping these days
to keep this map up to date.
It is becoming crowded, for
Dayton Tie Installations are
increasing so rapidly.

"Shock Absorber" Track is
popular—it has stood the test.

**The Dayton Mechanical Tie Co.,
Dayton, Ohio.**

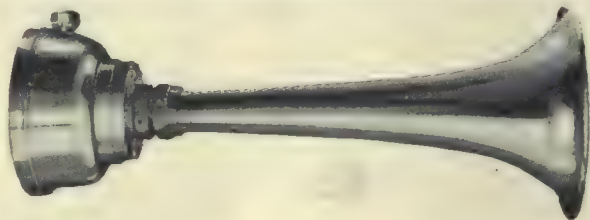
The creation and maintenance of car advertising space values requires the same degree of highly specialized knowledge as the construction and maintenance of railroads. Such tasks should be delegated only to those of widest experience and longest record of success.



Barron G. Collier

INCORPORATED

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The Strombos Signal operates on an air pressure of 10 lbs. and over and is controlled by a lever valve and cord. It uses only 1/10 the volume of air required by a whistle. It has no moving parts which might fail in the emergency.

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INCORPORATED
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Years can be added to the life of any iron pole which has become corroded at the ground level with our REINFORCING CLAMPS, or added height may be obtained by using the EXTENSION CLAMPS.

ALSO MOUNTS FOR WOOD POLES.

Ask for quotations on your requirements.

The Clark-Williams Engr. Co.
886 Main St., Bridgeport, Conn.

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They prevent creeping moisture and quickly drain the petticoat in wet weather, keeping the inner area dry.

The Above Insulator—No. 72—Voltages—Test—Dry 64,000 Wet 31,400, Line 10,000.

Our engineers are always ready to help you on your glass insulator problem. Write for catalog.

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Muncie, Ind.
Est. 1848—Inc. 1870

PANTASOTE

Trade Mark

Seat and Curtain Materials

There is no substitute for Pantasote

AGASOTE

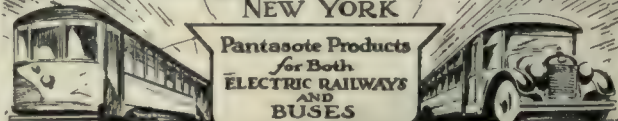
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Roofing—Headlining—Wainscoting

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and motor buses*

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Chilled Rims
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Not if you use

AJAX

BABBITT for ARMATURES

keeps the rolling stock rolling



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Established 1880

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CLEVELAND



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480-Lb. Hoist Pulls 72-Ton Cars

In the picture, a 145,000-pound tank of "Tar-Mac" is being pulled away from the unloading pit by the little 480-pound Sullivan Electric Hoist. Both loaded and empty cars are handled with the outfit, much quicker and much cheaper than hand labor could handle them.

Yet—no big investment in equipment was required—and power consumption, depreciation and maintenance are small.

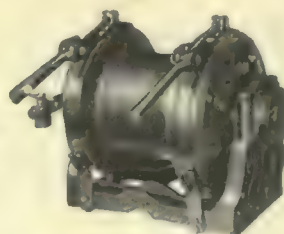
You, too, can move cars cheaper with a

Sullivan Portable Hoist

They're easy to handle. They don't get out of order. They use power only while work is being done. Don't you want to know more about them?

Get Bulletin 3276-G for electric hoists or
3276-F for Turbinair hoists

Single and
double drum,
air and elec-
tric hoists are
available for
car pulling,
scraper work

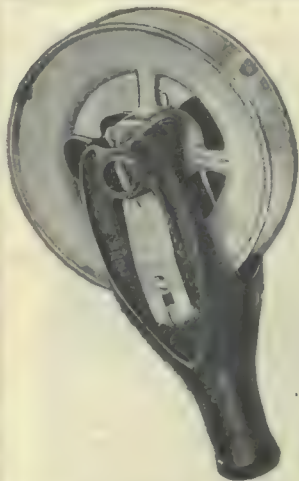


or lifting jobs.
Will lift a ton
vertically, on
single line at
110 feet per
minute.

Single-Drum Turbinair Hoist.
Weight, 345 Pounds.

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Lift a load off the fare box

Large railroads and public utilities do not purchase Tribloc Chain Hoists merely because they have a "well-groomed" appearance—it is their performance under the shocks and strains of shop work that has won the recognition of these buyers.

You, too, can know the benefits of using the right size and type of Ford Chain Hoist. All we ask is a brief description of the job—we shall be glad to tell you why and how some type of Ford Hoist can pay its way in your shop and "lift a load off the fare box." Send for Catalog 7-B.

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2nd and Diamond Sts., Philadelphia, Penna.

We also manufacture "THE MOTORBLOC"
an electrically driven chain hoist.

Change a wheel? Change a harp?
Change a pole?

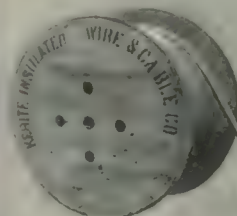


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quickness means money

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Isn't this a worth while saving of time and trouble? Write us for details. Also Bayonet Special Trolley Wheels and Sleet Cutters.

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in a half-century of
continuous production,
has spun out a record
of performance
that is
unequalled in the
history of insulated
wires and cables

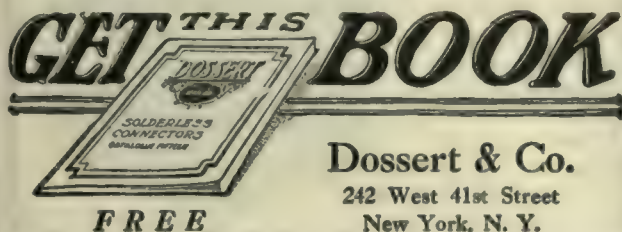
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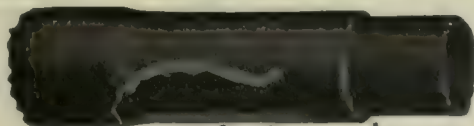
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Pettingell-Andrews Co., Boston, Mass.

F. D. Lawrence Electric Co., Cincinnati, O.

Novelty Electric Co., Phila., Pa.

Can. Rep.: Engineering Materials Limited, Montreal.

Cuban Rep.: Victor G. Mendoza Co., Havana.



Reg. U. S. Pat. Office

AMELECTRIC PRODUCTS

BARE COPPER WIRE AND CABLE

TROLLEY WIRE

WEATHERPROOF WIRE
AND CABLE

PAPER INSULATED
UNDERGROUND CABLE

MAGNET WIRE

AMERICAN ELECTRICAL WORKS
PHILLIPSDALE, R. I.

Boston, 178 Federal; Chicago, 30-32 West Randolph Street;
Cincinnati, Traction Bldg.; New York, 100 E. 42nd St.

Kalamazoo Trolley Wheels

The value of Kalamazoo Trolley
Wheels and Harps has been
demonstrated by large and small
electric railway systems for a
period of thirty years. Being
exclusive manufacturers, with
no other lines to maintain, it is
through the high quality of our
product that we merit the large
patronage we now enjoy. With
the assurance that you pay no
premium for quality we will
appreciate your inquiries.



THE STAR BRASS WORKS
KALAMAZOO, MICH., U. S. A.



THORNTON

side bearing type of trolley wheel
mounting does more than merely
increase the mileage and life of the
wheel. It makes it run more quietly
and smoothly. It eliminates de-
structive vibration. The method of
lubrication is such that these wheels
will run from one to four weeks on
one filling of the grease reservoir.

Write for references.

Thornton Trolley Wheel Co.
Incorporated
Ashland, Kentucky

The Most Successful Men in the Electric Railway

Industry read the

ELECTRIC RAILWAY JOURNAL

Every Week



Type R-11
Double Register

International Registers

Made in single and double
types to meet requirements
of service. For hand or foot,
mechanical or electric opera-
tion. Counters, car fittings,
conductors' punches.

The International Register Co.
15 South Throop Street, Chicago, Illinois

Waterproofed Trolley Cord



Is the finest cord that science and skill can produce.
Its wearing qualities are unsurpassed.

**FOR POSITIVE SATISFACTION ORDER
SILVER LAKE**

If you are not familiar with the quality you will be
surprised at its **ENDURANCE and ECONOMY.**

Sold by Net Weights and Full Lengths

SILVER LAKE COMPANY

Manufacturers of bell, signal and other cords.
Newtonville, Massachusetts

SEARCHLIGHT SECTION

USED EQUIPMENT & NEW—BUSINESS OPPORTUNITIES

UNDISPLAYED—RATE PER WORD

Positions Wanted, 4 cents a word, minimum 75 cents an insertion, payable in advance.
Positions Vacant and all other classifications, 8 cents a word, minimum charge \$2.00.
Proposals, 60 cents a line an insertion.

INFORMATION

Box Numbers in care of any of our offices count 10 words additional in undisplayed ads.
Discount of 10% if one payment is made in advance for four consecutive insertions of undisplayed ads (not including proposals).

DISPLAYED—RATE PER LINE

1 to 3 inches, \$1.50 an line
4 to 7 inches, \$3.00 an line
8 to 14 inches, \$4.50 an line
Rates for larger spaces, on application of request.
In advertising such is measured vertically as one column, 3 columns—30 inches—to a page.

Searchlight Results:

Equipment For Sale:

"Our advertisement in the Electric Railway Journal located a buyer, and I have disposed of the car in question."

President—Buffalo Industrial Plant.

"We have disposed of all of our Girder Rails advertised in your paper. We are frank to tell you that the material went to three different traction lines and represents three separate and distinct new accounts. Our idea is that when it comes to bringing something to buyers in the traction field, there is but one sheet, and that is yours."

Dealer—New York City.

"There is no necessity for the continuation of this advertising, for the reason that we could have sold this equipment five times over from the advertisement that was run one time."

Superintendent—A Pennsylvania Railway Co.

Equipment Wanted:

"The two insertions of this advertisement which you displayed in admirable manner were sufficient to obtain for us the exact equipment that we desired."

Superintendent—A New England Railway Co.

Positions Vacant:

"The strongest proof that your Searchlight Department finds its way to many readers is shown by the numerous letters we have received in answer to our recent advertisement."

Secretary—A Connecticut Railway Co.

"You gave us one good man as a result of a similar advertisement in the Electric Railway Journal some time ago. Please give us another."

Proprietor of Steel Sales Agency.

Positions Wanted:

"The result of advertising in the Searchlight Section of your Electric Railway Journal I have secured a position with The ——— Traction Co. of W. Va."

"I received 8 replies and accepted a position with the ——— Railway Co. with over 30% increase in salary."

Business Opportunity:

"Advertisement for investment to develop or acquire Traction Light & Fr. The results from the advertisement in Electric Railway Journal have been satisfactory."

New York City Attorney.

POSITIONS VACANT

ENGINEERING assistant in general manager's office of an Eastern Pennsylvania street railway company. Must be aggressive, of sound judgment and have had at least five years' business, engineering or sales experience. State age, experience, references, salary desired and if possible submit photo. P-948, Electric Railway Journal, 1600 Arch St., Philadelphia, Pa.

POSITIONS WANTED

OPERATING man: Capable of taking charge of transportation department of electric railway. Practical experience in each of its branches. Highest of references. PW-944, Electric Railway Journal, 7 So. Dearborn St., Chicago, Ill.

OPERATING and maintenance executive, fifteen years' practical experience in all branches of electric railway and motor bus transportation; broad experience in schedule making, public, labor problems and requirements for successful and efficient operation of both; University graduate; A-1 references. PW-947, Electric Railway Journal, Guardian Bldg., Cleveland, Ohio.

SUPERINTENDENT, thoroughly reliable and capable, with excellent references, desires change. Not being forced out but looking for better opportunities. Widely experienced in both city and interurban operation, commendable past record for success in employee training and management, accident reduction, public relations, and the general solution of operating problems. PW-950, Electric Railway Journal, Tenth Ave. at 36th St., New York.

SUPERINTENDENT of transportation available, broad experience and fine record of achievements on large properties in East and Central West. Recognized as operating official of exceptional ability, successful in public relations, rehabilitation of properties, skilled in handling labor; capable taking over any property and getting results under any condition. High-class references. Correspondence invited and treated confidential. Willing to locate anywhere. PW-949, Electric Railway Journal, Guardian Bldg., Cleveland, Ohio.

OFFICIAL PROPOSAL

Bids: Dec. 15.

Car Advertising Space

Honolulu, Hawaii.

Sealed proposals for the leasing of car advertising space in the street cars and buses operated by the Honolulu Rapid Transit Co., Ltd., of Honolulu, Hawaii, will be received at their office, 1183 Alapai Street, Honolulu, T.H., up to 12 o'clock noon, Wednesday, Dec. 15, 1926.

Specifications as to bids may be obtained from the office of the Company, the Electric Railway Journal or Electric Traction.

The company reserves the right to reject any or all bids.

FOR SALE

14 BIRNEY SAFETY CARS

Brill Built

West. 508 or G.E. 264 Motors
Cars Complete—Low Price—Fine Condition

ELECTRIC EQUIPMENT CO.
Commonwealth Bldg., Philadelphia, Pa.

RAILWAY EQUIPMENT

Must Be Moved Quickly!

BIRNEY CARS

4—32 seating capacity. Westinghouse 508A Motors. Fully equipped. Splendid condition.

SOUTHERN CARS

6—Double truck, 42 passenger. One man operation.

WHITE TOWER TRUCK

1—2 1/2-3 ton White. Three section Trenton Tower. Fully equipped. New 1023.

RAIL SWITCHES

7-in. Girder, hard center construction.
7-in. Tee Rail. Switch Mates and Frogs.

RAILWAY MOTORS

Westinghouse 307's.

CRANE

20-ton Hand Operated Northern Crane, 54 ft. span.

For Further Particulars, Write

H. E. SALZBERG
CO., Inc.

50 Church St., N. Y. C.

MOTORS

20 Westinghouse 306 8-V Complete.
\$250 each.

IRVING S. VAN LOAN CORPORATION
1750 Broadway, New York City
Specialists in street cars or any part of a street car.

Illustrated bulletin supplied on request.

500 tons 70 lb. Relaying Rails with Angle Bars, Bolts and Spikes.
5 Miles 2/0 Copper Trolley Wire.
2 1/2 Miles 4/0 Copper Trolley Wire.
500 Trolley Poles.
8,000 Ties for 4-ft. 8 1/2-in. Track.
300 Trolley Arms.

Located near Shamokin, Penna.

In first class condition.

Low price for immediate sale.

E. W. PETERS

Danville, Penna.

FOR SALE

ONE SNOW PLOW

Wason Single Truck—with 2 Westinghouse No. 40 Motors K.10 Control. Plow in good condition—ready to operate. Reasonable price.

Hudson River and Eastern Traction Co.
Ossining, N. Y.

WHAT AND WHERE TO BUY

Advertising, Street Car
Collier, Inc., Barron G.

Air Brakes

Christensen Air Brake Co.
Westinghouse Air Brake Co.
Air Receivers & Aftercoolers
Ingersoll-Rand Co.

Anchor, Guy

Elec. Service Supplies Co.
Ohio Brass Co.
Westinghouse E. & M. Co.

Armature Shop Tools

Elec. Service Supplies Co.
Columbia Machine Works

Automatic Regulators, Current, Voltage & Synchronizing
American Brown Boveri Corp.

Automatic Return Switch

Stands
Ramapo Ajax Corp.

Automatic Safety Switch

Stands
Ramapo Ajax Corp.

Axles

Bemis Car Truck Co.
Bethlehem Steel Co.
Brill Co., The J. G.
Carnegie Steel Co.
Cincinnati Car Co.
Johnson & Co., J. R.
National Railway Appliance Co.
St. Louis Car Co.
Standard Steel Works
Westinghouse E. & M. Co.

Axles, Carbon Vanadium

Johnson & Co., J. R.

Axles, Steel

Bethlehem Steel Co.
Carnegie Steel Co.
Johnson & Co., J. R.

Babbitt Metal

Ajax Metal Co.
Johnson & Co., J. R.
More-Jones Brass & Metal Co.

Badges and Buttons

Elec. Service Supplies Co.
International Register Co.

Bearings, Anti-Friction

Hyatt Roller Bearings Co.

Bearings, Ball

Ahlberg Bearing Co.

Bearings and Bearing Metals

Ajax Metal Co.
Bemis Car Truck Co.
Brill Co., The J. G.
General Electric Co.
More-Jones Brass & Metal Co.

Bells and Buzzers

Consolidated Car Heating Co.

Bells and Gongs

Brill Co., The J. G.
Elec. Service Supplies Co.
St. Louis Car Co.

Benders, Rail

Railway Trackwork Co.

Bodies, Bus

Baker-Raulang Co.
J. G. Brill Co.
Cummings Car & Coach Co.
Lang Body Co.

Bodies, Passenger Car

Baker-Raulang Co.

Body Material—Haskelite & Plymet

Haskelite Mfg. Corp.

Boilers

Babcock & Wilcox Co.

Bolts, Nuts, Rivets

Russell, Burdall & Ward
Nut & Bolt Co.

Bond Testers

Amer. Steel & Wire Co.
Elec. Service Supplies Co.

Bonding Apparatus

Amer. Steel & Wire Co.
Electric Railway Improvement Co.

Bonds, Rail

American Steel & Wire Co.
Electric Railway Improvement Co.

Bonds, Steel

Elec. Service Supplies Co.
Ohio Brass Co.
Railway Trackwork Co.
Una Welding & Bonding Co.

Brackets, Hand Rail

Columbia Machine Wks.

Brackets and Cross Arms

(See also Poles, Ties, Posts, etc.)

Columbia Machine Works

Electric Railway Equipment Co.

Elec. Service Supplies Co.

Hubbard & Co.

Ohio Brass Co.

Westinghouse E. & M. Co.

Brake Adjusters

Brill Co., The J. G.

National Ry. Appliance Co.

Westinghouse Tr. Br. Co.

Brake Shoes

American Brake Shoe & Foundry Co.

Bemis Car Truck Co.

Brill Co., The J. G.

St. Louis Car Co.

Brakes, Brake Systems and Brake Parts

Bemis Car Truck Co.

Brill Co., The J. G.

General Electric Co.

National Brake Co.

Safety Car Devices Co.

St. Louis Car Co.

Westinghouse Traction Brake Co.

Brushes, Carbon

General Electric Co.

Jeandron, W. J.

Le Carbon Co.

U. S. Graphite Co.

Westinghouse E. & M. Co.

Brushes, Graphite

U. S. Graphite Co.

Brushes, Wire, Pneumatic

Ingersoll-Rand Co.

Brush Holders

Columbia Machine Works

Haskelite Mfg. Corp.

Buses, Motor

Brill Co., The J. G.

Cummings Car & Coach Co.

International Harvester Co.

St. Louis Car Co.

Studebaker Corp. of Amer.

White Co.

Bushings, Case Hardened and Manganese

Bemis Car Truck Co.

Brill Co., The J. G.

Columbia Machine Works

St. Louis Car Co.

Cables (See Wires and Cables)

Cambric Tapes, Yellow and Black Varnished

Irvington Varnish & Ins. Co.

Mica Insulator Co.

Carbon Brushes (See Brushes, Carbon)

Car Lighting Fixtures

Elec. Service Supplies Co.

Car Panel Safety Switches

Consolidated Car Heating Co.

Westinghouse E. & M. Co.

Car Wheels, Rolled Steel

Bethlehem Steel Co.

Cars, Dump

Brill Co., The J. G.

Differential Steel Car Co.

St. Louis Car Co.

Cars, Gas, Electric

Brill Co., The J. G.

General Electric Co.

Westinghouse Elec. & Mfg. Co.

Cars, Gas, Rail

Brill Co., The J. G.

St. Louis Car Co.

Cars, Passenger, Freight, Express, etc.

Amer. Car Co.

Brill Co., The J. G.

Cincinnati Car Co.

Cummings Car & Coach Co.

Kuhlman Car Co., G. C.

National Ry. Appliance Co.

St. Louis Car Co.

Wason Mfg. Co.

Cars, Second Hand

Electric Equipment Co.

Cars, Self-Propelled

Brill Co., The J. G.

General Electric Co.

Castings, Brass Composition or Copper

Ajax Metal Co.

More-Jones Brass & Metal Co.

Castings, Gray Iron and Steel

American Steel Foundries

Bemis Car Truck Co.

St. Louis Car Co.

Standard Steel Works Co.

Wm. Wharton, Jr. & Co., Inc.

Castings, Malleable & Brass

Bemis Car Truck Co.

St. Louis Car Co.

Catchers and Retrievers, Trolley

Earl, C. I.

Elec. Service Supplies Co.

Ohio Brass Co.

Wood Co., Chas. N.

Catenary Construction

Archbold-Brady Co.

Ceiling Car

Haskelite Mfg. Corp.

Pantastote Co., Inc.

Ceilings, Plywood Panels

Haskelite Mfg. Corp.

Chairs, Parlor Car

Raywood-Walkfield Co.

Change Carriers

Cleveland Fare Box Co.

Electric Service Supplies Co.

Circuit-Breakers

American Brown Boveri Corp.

General Electric Co.

Westinghouse E. & M. Co.

Clamps and Connectors for

Wires and Cables

Columbia Machine Works

Dossert & Co.

Electric Railway Equipment Co.

Elec. Ry. Improvement Co.

Elec. Service Supplies Co.

General Electric Co.

Hubbard & Co.

Ohio Brass Co.

Westinghouse E. & M. Co.

Cleaners and Scrapers, Track

(See also Snow-Plows, Sweepers and Brooms)

Brill Co., The J. G.

Cincinnati Car Co.

Ohio Brass Co.

St. Louis Car Co.

Clusters and Sockets

General Electric Co.

Coal and Ash Handling (See Conveying and Hoisting Machinery)

Coil Banding and Winding

Machines

Elec. Service Supplies Co.

Westinghouse E. & M. Co.

Coils, Armature and Field

General Electric Co.

Westinghouse E. & M. Co.

Coils, Choke and Kicking

Elec. Service Supplies Co.

General Electric Co.

Westinghouse E. & M. Co.

Coin Counting Machines

Cleveland Fare Box Co.

International Register Co.

Coin Sorting Machines

Cleveland Fare Box Co.

Coin Wrappers

Cleveland Fare Box Co.

Commutator Slotters

Columbia Machine Works

Elec. Service Supplies Co.

General Electric Co.

Westinghouse E. & M. Co.

Wood Co., Chas. N.

Commutator Truing Devices

General Electric Co.

Commutators or Parts

Cameron Elec. Mfg. Co.

General Electric Co.

Westinghouse E. & M. Co.

Compressors, Air

General Electric Co.

Ingersoll-Rand Co.

Sullivan Machinery Co.

Westinghouse Tr. Br. Co.

Compressors, Air, Portable

Ingersoll-Rand Co.

Sullivan Machinery Co.

Compressors, Gas

Sullivan Machinery Co.

Condensers

General Electric Co.

Ingersoll-Rand Co.

Westinghouse E. & M. Co.

Condenser Papers

Irvington Varnish & Ins. Co.

Connectors, Solderless

Dossert & Co.

Westinghouse E. & M. Co.

Connectors, Trailer Car

Columbia Machine Wks.

Consolidated Car Heating Co.

Elec. Service Supplies Co.

Ohio Brass Co.

Controllers or Parts

General Electric Co.

Westinghouse E. & M. Co.

Controller Regulators

Elec. Service Supplies Co.

Controlling Systems

General Electric Co.

Westinghouse E. & M. Co.

Converters, Rotary

General Electric Co.

Westinghouse E. & M. Co.

Copper Wire

American Brass Co.

American Steel & Wire Co.

Anaconda Copper Mining Co.

Rome Wire Co.

Copper Wire Instruments

Measuring Testing and Recording

American Brass Co.

American Steel & Wire Co.

Anaconda Copper Mining Co.

Cord, Bell, Trolley, Register

American Steel & Wire Co.

Brill Co., The J. G.

Elec. Service Supplies Co.

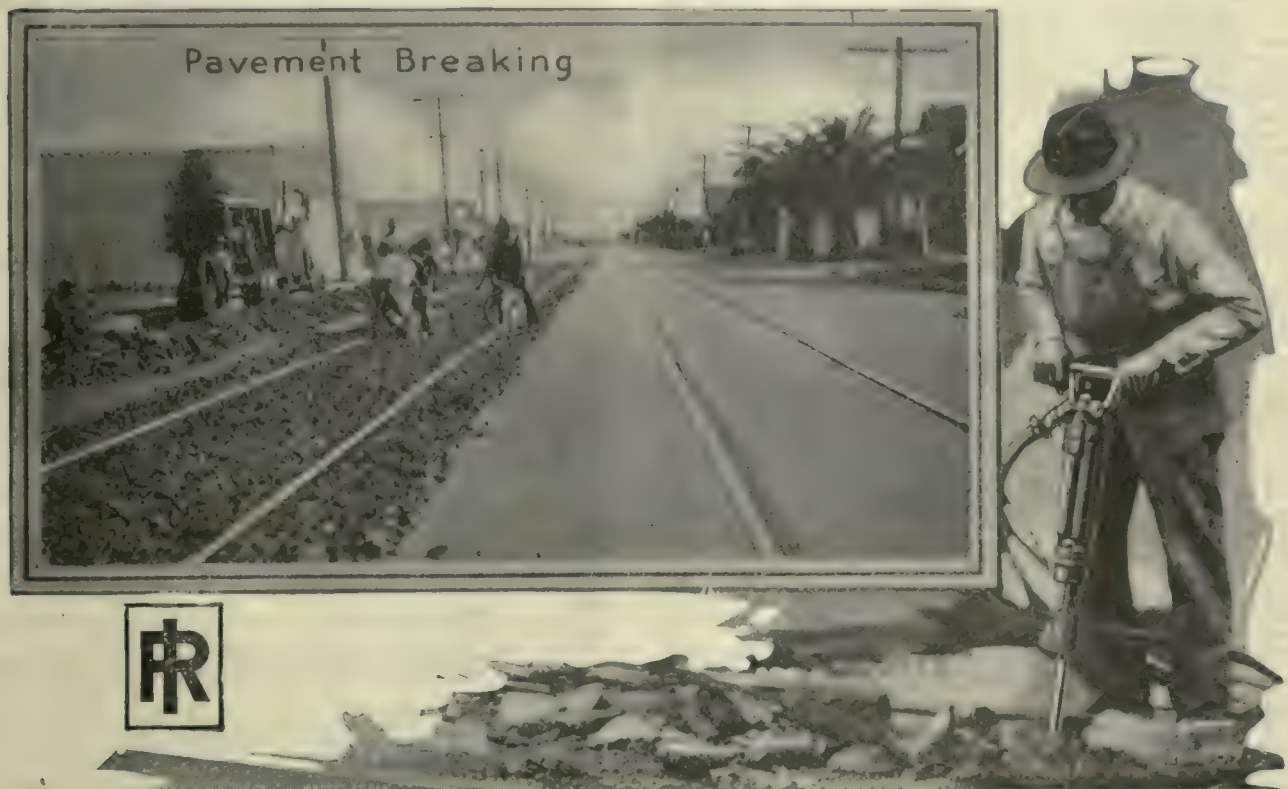
International Register Co.

Roebbling's Sons Co., J. A.

St. Louis Car Co.

Samson Cordage Works

I-R Portable Air Power Units



Pavement breaking at a fraction of the cost of hand work

Records of many jobs on different roads show that Ingersoll-Rand Paving Breakers operated from an I-R Portable Compressor have reduced the cost of concrete breaking by at least one half, as compared to hand methods.

A combination of Ingersoll-Rand tools and compressor proves a great labor-saver for railway companies. The compressor can be used to operate not only concrete breakers, but I-R pneumatic tie tampers, rail drills, rock drills, sand blast, paint spray, riveters, etc.—all important labor and time savers.

INGERSOLL-RAND COMPANY—11 BROADWAY, NEW YORK CITY.

Offices in principal cities the world over

FOR CANADA REFER—CANADIAN INGERSOLL-RAND CO. LIMITED, 260 ST. JAMES STREET, MONTREAL, QUEBEC.

Ingersoll-Rand

73-PC

- Glider Rails**
Bethlehem Steel Co.
Lorain Steel Co.
- Gongs (See Bells and Gongs)**
- Greases (See Lubricants)**
- Grinders and Grinding Supplies**
Metal & Thermit Corp.
Railway Trackwork Co.
- Grinders, Portable**
Railway Trackwork Co.
- Grinders, Portable Electric**
Railway Trackwork Co.
- Grinding Bricks and Wheels**
Railway Trackwork Co.
- Guard Rail Clamps**
Ramapo Ajax Corp.
Wm. Wharton, Jr. & Co., Inc.
- Guard Rails, Tee Rail and Manganeses**
Ramapo Ajax Corp.
Wm. Wharton, Jr. & Co., Inc.
- Guards, Trolley**
Elec. Service Sup. Co.
Ohio Brass Co.
- Hammers, Pneumatic**
Ingersoll-Rand Co.
- Harpes, Trolley**
Bayonet Trolley Harp Co.
Columbia Machine Works
Elec. Service Supplies Co.
More-Jones Brass & Metal Co.
Nuttall Co., R. D.
Star Brass Works
Thornton Trolley Wheel Co.
- Headlights**
Elec. Service Supplies Co.
General Electric Co.
Ohio Brass Co.
St. Louis Car Co.
- Headlining**
Columbia Machine Works
Haskelite Mfg. Corp.
Pantasote Co., Inc.
- Heaters, Car (Electric)**
Consolidated Car Heating Co.
Gold Car Heat. & Light. Co.
Natl. Ry. Appliance Co.
Smith Heater Co., Peter
- Heaters, Car, Hot Air and Water**
Smith Heater Co., Peter
- Heaters, Car, Stove**
Smith Heater Co., Peter
- Helmets—Welding**
Railway Trackwork Co.
Una Welding & Bonding Co.
- Holts, Bus**
Columbia Machine Wks.
- Holts and Lifts**
Ford Chain Block & M. Co.
- Holts, Portable**
Ingersoll-Rand Co.
- Horns, Car**
American Strombos Co.
- Hose, Bridges**
Ohio Brass Co.
- Hose, Pneumatic**
Westinghouse Traction Brake Co.
- Ignition Units**
Leece-Neville Co.
- Industrial Tractors**
International Harvester Co.
- Instruments, Measuring, Testing and Recording**
American Steel & Wire Co.
General Electric Co.
Westinghouse E. & M. Co.
- Insulating Cloth, Paper and Tape**
General Electric Co.
Irvington Varnish & Ins. Co.
Mica Insulator Co.
Okonite Co.
Okonite-Callender Cable Co., Inc.
U. S. Rubber Co.
Westinghouse E. & M. Co.
- Insulating Silk**
Irvington Varnish & Ins. Co.
- Insulating Varnishes**
Irvington Varnish & Ins. Co.
- Insulation (See also Paints)**
Electric Railway Equipment Co.
Electric Service Sup. Co.
General Electric Co.
Irvington Varnish & Ins. Co.
Mica Insulator Co.
Okonite Co.
Okonite-Callender Cable Co., Inc.
U. S. Rubber Co.
Westinghouse E. & M. Co.
- Insulation Riot**
Irvington Varnish & Ins. Co.
- Insulator Pins**
Elec. Service Supplies Co.
Hubbard & Co.
- Insulators (See also Line Material)**
Electric Railway Equipment Co.
Elec. Service Supplies Co.
General Electric Co.
Hemmings Glass Co.
Irvington Varnish & Ins. Co.
Ohio Brass Co.
Westinghouse E. & M. Co.
- Interior Side Linings**
Haskelite Mfg. Corp.
- Interurban Cars (See Cars Passenger, Freight Express etc.)**
- Jacks (See also Cranes, Hoists and Lifts)**
Buda Co.
Columbia Machine Wks.
Elec. Service Supplies Co.
National Railway Appliance Co.
- Joints, Rail (See Rail Joints)**
- Journal Boxes**
Bemis Car Truck Co.
Brill Co., The J. G.
S. K. F. Industries
St. Louis Car Co.
Lamps, Guards and Fixtures
Elec. Service Sup. Co.
General Electric Co.
Westinghouse E. & M. Co.
- Lamps, Arc and Incandescent (See also Headlights)**
General Electric Co.
Westinghouse E. & M. Co.
- Lamps, Signal and Marker**
Elec. Service Supplies Co.
Nichols-Lintern Co.
Ohio Brass Co.
- Letter Boards**
Haskelite Mfg. Corp.
- Lighting Systems**
Leece-Neville Co.
- Lightning Protection**
Electric Service Sup. Co.
General Electric Co.
Ohio Brass Co.
- Westinghouse E. & M. Co.**
- Line Material (See also Brackets, Insulators, Wires, etc.)**
Dossert & Co.
Electric Railway Equipment Co.
Electric Service Sup. Co.
General Electric Co.
Hubbard & Co.
More-Jones Brass & Metal Co.
Ohio Brass Co.
Westinghouse E. & M. Co.
- Locking Spring Boxes**
Wm. Wharton, Jr. & Co., Inc.
- Locomotives, Electric**
American Brown Boveri Corp.
Cummings Car & Coach Co.
General Electric Co.
St. Louis Car Co.
Westinghouse E. & M. Co.
- Locomotives, Diesel, Electric**
American Brown Boveri Corp.
- Locomotives, Oil Engine, Electric Driven**
Ingersoll-Rand Co.
- Lubricating Engineers**
Standard Oil Co. (of Ind.)
Texas Co.
- Universal Lubricating Co.**
- Lubricants, Oil and Grease**
Standard Oil Co. (of Ind.)
Texas Co.
- Universal Lubricating Co.**
- Machinery, Insulating**
Amer. Insulating Mach. Co.
- Manganeses Parts**
Bemis Car Truck Co.
- Manganeses Steel Castings**
Wm. Wharton, Jr. & Co., Inc.
- Manganeses Steel Guard Rails**
Ramapo Ajax Corp.
Wm. Wharton, Jr. & Co., Inc.
- Manganeses Steel, Special**
Track Work
Bethlehem Steel Co.
Ramapo Ajax Corp.
Wm. Wharton, Jr. & Co., Inc.
- Manganeses Steel Switches**
Fraga and Crossings
Bethlehem Steel Co.
Ramapo Ajax Corp.
Wm. Wharton, Jr. & Co., Inc.
- Mica**
Mica Insulator Co.
- Motor Buses (See Buses, Motor)**
- Motor and Generator Sets**
American Brown Boveri Corp.
General Electric Co.
- Motor Leads**
Dossert & Co.
- Motors, Electric**
General Electric Co.
Westinghouse E. & M. Co.
- Motorman's Seats**
Brill Co., The J. G.
Electric Service Sup. Co.
Hale-Kilburn Co.
Heywood-Wakefield Co.
St. Louis Car Co.
Wood Co., Chas. N.
- Nuts and Bolts**
Bemis Car Truck Co.
Bethlehem Steel Co.
Hubbard & Co.
- Oils (See Lubricants)**
- Omnibuses (See Buses, Motor)**
- Oxy-Acetylene (See Cutting Apparatus Oxy-Acetylene)**
- Oxygen**
International Oxygen Co.
- Packing, Asbestos**
Johns-Manville, Inc.
- Packing**
U. S. Rubber Co.
Westinghouse Traction Brake Co.
- Paints and Varnishes (Insulating)**
Electric Service Sup. Co.
Irvington Varnish & Ins. Co.
Mica Insulator Co.
National Ry. Appliance Co.
- Panels, Outside, Inside**
Haskelite Mfg. Corp.
- Pavement Breakers**
Sullivan Machinery Co.
- Pickups, Trolley Wire**
Elec. Service Supplies Co.
Ohio Brass Co.
- Pinion Pullers**
Elec. Service Supplies Co.
General Electric Co.
Wood Co., Chas. N.
- Pins (See Gears)**
- Plas, Case Hardened, Wood and Iron**
Bemis Car Truck Co.
Ohio Brass Co.
Westinghouse Tr. Brake Co.
- Pipe Fittings**
Standard Steel Works
Westinghouse Tr. Brake Co.
- Planers (See Machine Tools)**
- Plates for 7-c Rail Switches**
Ramapo Ajax Corp.
- Pilers, Rubber Insulated**
Electric Service Sup. Co.
National Railway Appliance Co.
- Plywood, Roofs, Headlining**
Floors, Interior Panels.
Bulkheads, Truss Planks
Haskelite Mfg. Corp.
- Pneumatic Tools**
Ingersoll-Rand Co.
- Pole Clamps**
Clark-Williams Eng. Co.
- Pole Line Hardware**
Bethlehem Steel Co.
Electric Service Sup. Co.
Ohio Brass Co.
- Poles, Metal Street**
Electric Railway Equipment Co.
Hubbard & Co.
- Pole Mountings**
Clark-Williams Eng. Co.
- Pole Reinforcing**
Hubbard & Co.
- Poles and Ties Treated**
Bell Lumber Co.
International Creosoting & Construction Co.
- Poles, Ties, Posts, Piling and Lanes**
Bell Lumber Co.
International Creosoting & Construction Co.
- Naugle Pole & Tie Co.**
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International Register Co.
Wood Co., Chas. N.
- Rail Braces and Fastenings**
Ramapo Ajax Corp.
- Rail Grinders (See Grinders)**
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Electric Service Sup. Co.
Hale-Kilburn Co.
St. Louis Car Co.
- Rattan Car Seat Webbing**
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American Brown Boveri Corp.
- Registers and Fittings**
Brill Co., The J. G.
Cincinnati Car Co.
Electric Service Sup. Co.
International Register Co.
St. Louis Car Co.
- Reinforcement, Concrete**
Amer. Steel & Wire Co.
Bethlehem Steel Co.
Carnegie Steel Co.
- Repair Shop Appliances (See also Coil Banding and Winding Machines)**
Elec. Service Supplies Co.
- Repair Work (See also Coils)**
General Electric Co.
Westinghouse E. & M. Co.
- Replacers, Car**
Electric Service Sup. Co.
- Resistances**
Consolidated Car Heating Co.
- Resistance, Wire and Tube**
Amer. Steel & Wire Co.
General Electric Co.
Westinghouse E. & M. Co.
- Retrievers, Trolley (See Catchers and Retrievers, Trolley)**
- Rheostats**
General Electric Co.
Mica Insulator Co.
Westinghouse E. & M. Co.
- Roller Bearings**
Hyatt Roller Bearing Co.
- Roofing, Car**
Haskelite Mfg. Corp.
Pantasote Co., Inc.
- Roofs, Car & Bus**
Haskelite Mfg. Corp.
- Rubber Specialties of All Kinds**
U. S. Rubber Co.
- Safety Control Devices**
Safety Car Devices Co.
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Brill Co., The J. G.
Electric Service Sup. Co.
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- Sash Fixtures, Car**
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- Scrapers, Track (See Cleaners and Scrapers, Track)**
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Brill Co., J. G.
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Haskelite Mfg. Corp.
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- Seats, Bus**
Brill Co., The J. G.
Hale-Kilburn Co.
Heywood-Wakefield Co.
S. Karpén & Bros.
St. Louis Car Co.
- Seats, Car (See also Rattan)**
Brill Co., The J. G.
Hale-Kilburn Co.
Heywood Wakefield Co.
St. Louis Car Co.
- Second Hand Equipment**
Electric Equipment Co.
Hudson River & Eastern Traction Co.
E. W. Peters
H. E. Salzberg Co., Inc.
Van Loan Corp., Irving S.
- Shades, Vestibule**
Brill Co., The J. G.
- Shovels**
Brill Co., The J. G.
Hubbard & Co.
- Shovels, Power**
Brill Co., The J. G.
- Slide Bearings (See Bearings Center and Side)**
- Signals, Car Starting**
Consolidated Car Heating Co.
Electric Service Sup. Co.
National Pneumatic Co., Inc.
- Signal Systems, Block**
Electric Service Sup. Co.
Nachod & U. S. Signal Co.
Wood Co., Chas. N.
- Signal Systems, Highway Crossing**
Nachod & U. S. Signal Co.
- Slack Adjusters (See Brake Adjusters)**
- Slag**
Carnegie Steel Co.
- Sleet Wheels and Cutters**
Bayonet Trolley Harp Co.
Elec. Ry. Improvement Co.
Electric Railway Equipment Co.
- Electric Service Sup. Co.**
- More-Jones Brass & Metal Co.**
- Nuttall Co., R. D.**
- Snow-Plows, Sweepers and Brooms**
Brill Co., The J. G.
Consolidated Car Fender Co.
Cummings Car & Coach Co.
St. Louis Car Co.
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J. G. Brill Co.
Heywood-Wakefield Co.
- Soldering and Brazing Apparatus (See Welding Processes and Apparatus)**
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Irvington Varnish & Ins. Co.
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Bethlehem Steel Co.
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Westinghouse E. & M. Co.
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Consolidated Car Heating Co.
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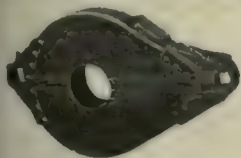
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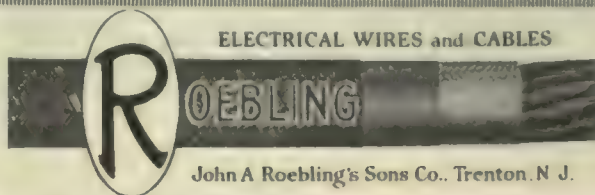
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Page		Page		Page		Page	
A		E		K		S	
Ahlberg Bearing Co. Insert 32		Earl, C. I. 57		Karpen & Bros., S. 26		Rome Wire Co. Insert 11-12	
Ajax Metal Co., The. 55		Electric Equipment Co. 53		Kelker, DeLeuw & Co. 60		Russell, Burdall & Ward Bolt	
American Brass Co., The. 67		Electric Railway Equipment Co. 69		Kelly Cooke & Co. 60		& Nut Co. 34	
American Brown Boveri Electric		Electric Railway Improvement		Kerite Ins. Wire & Cable Co. 56			
Corp. 16, 17		Co. 61		Kuhlman Car Co. 60			
American Car Co. 69		Electric Service Supplies Co. 7					
American Electrical Works. 62				L		S	
American Insulating Mach. Co. 62				Lang Body Co., The. Insert 41-42		S. K. F. Industries, Inc. 38	
American Spiral Spring 59		F		Le Carbone Co. 57		St. Louis Car Co. 37	
American Steel Foundries. 6		Fisk Tire Co., The. 22		Leece Neville Co. 40		Safety Car Devices Co. 8	
American Steel & Wire Co. 58		Ford Chain Block Co. 56		Lorain Steel Co., The. 58		Salzberg Co., Inc., H. E. 63	
American Strombos Co. 54		Ford, Bacon & Davis, Inc. 60				Samson Cordage Works. 67	
Anaconda Copper Mining Co. 67		"For Sale" Ads. 63				Sanderson & Porter. 60	
Archbold-Brady Co. 61						Searchlight Section 63	
		G				Silver Lake Co. 62	
B		General Electric Co., 20, Back Cover		M		Smith Heater Co., Peter. 67	
Babcock & Wilcox Co. 61		General Tire & Rubber Co., The. 24		McCardell Co., J. R. 57		Standard Oil Co. 48	
Baker-Raulang Co., The. 27		Globe Ticket Co. 48		McClellan & Junkersfeld 60		Standard Steel Works Co. 43	
Bayonet Trolley Harp Co. 58		Gold Car Heating & Ltg. Co. 67		Metal & Thermit Corp. 67		Star Brasses Works. 62	
Beeler Organization, The. 60		Griffin Wheel Co., The. 56		Mica Insulator Co. 59		Stevens & Wood, Inc. 60	
Bell Lumber Co. 97				More-Jones Brass & Metal Co. 56		Stone & Webster, Inc. 60	
Bemis Car Truck Co. 59		H				Stucki Co., A. 61	
Bethlehem Steel Co. 58		Hale-Kilburn Co. 33		N		Studebaker Corp. Insert 30-31	
Bibbins, J. Rowland 60		Haskette Mfg. Corp. 50		Nachod and United States Signal		Sullivan Machinery Co. 55	
Brennan, F. J. 61		"Help Wanted" Ads. 63		Co., Inc. 61			
Bridgeport Brass Co. 9		Hemingray Glass Co. 54		National Brake Co., Inc. 21		T	
Brill Co., The J. G. 69		Hempill & Wells. 60		National Pneumatic Co. 13		Texas Co., The. 39	
Buchanan & Layng Corporation. 60		Heywood Wakefield Co. 23		National Railway Appliance Co. 58		Thornton Trolley Wheel Co. 62	
Buda Co., The. 50		Holst, Englehardt W. 60		Naugle Pole & Tie Co. 67		Tool Steel Gear & Pinion Co., The. 44	
Budd Wheel Co. 28		Hubbard & Co. 58		Nuttall Co., E. D. 49			
		Hudson River & Eastern Traction. 63		O		U	
C		Hyatt Roller Bearing Co. 36		Ohio Brass Co. 5		Una Welding & Bonding Co. 61	
Cameron Electric Mfg. Co. 97		I		Okonite-Callender Cable Co., Inc.,		United States Graphite Co. 49	
Carnegie Steel Co. 58		Ingersoll-Rand Co. 65		The 62		Universal Lubricating Co. 59	
Chillingworth Mfg. Co. 67		International Cresosoting &		Okonite Co., The. 62			
Cincinnati Car & Coach Co. 14-15		Constr. Co. 45				V	
Clark-Williams Engineering Co. 54		International Harvester Co. of				Van Loan Corp., Irving S. 63	
Cleveland Fare Box Co., The. 61		America 25		P			
Collier, Inc., Barron G. 53		International Oxygen Co. 61		Fantasote Co., Inc., The. 54		W	
Columbia Machine Works. 47		International Register Co. 62		Percy Mfg. Co., Inc. 67		"Want" Ads. 63	
Consolidated Car Fender Co., The. 48		International Steel Tie Co. 61		Peters, E. W. 63		Wason Mfg. Co. 69	
Consolidated Car Heating Co. 67				Positions Wanted and Vacant. 63		Kaukesha Motor Co. Insert 29	
Cummings Car & Coach Co. 35						Westinghouse Electric & Mfg.	
						Co. 10	
D						Westinghouse Traction Brake Co. 2	
Day & Zimmermann, Inc. 60						Wharton, Jr. & Co., Wm. 58	
Dayton Mech. Tie Co., Insert 51-52						"What and Where to Buy" 64, 66, 68	
Differential Steel Car Co., The. 59		J		R			
Dossert & Co. 57		Jackson, Walter					

Testing Instruments (See Instruments, Electrical Measuring, Testing, etc.)	Track, Special Work Bethlehem Steel Co. Ramapo Ajax Corp. Wm. Wharton, Jr. & Co., Inc.	Trolley Wheels and Harps Electric Service Supplies Co. More-Jones Brass & Metal Co. Star Brass Works Thornton Trolley Wheel Co.	Ventilators, Car Brill Co., The J. G. Cincinnati Car Co. Consolidated Car Heating Co. Nat'l Ry. Appliance Co. Railway Utility Co. St. Louis Car Co.	Welding Wire and Rods Railway Trackwork Co.
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Ticket Choppers & Destroyers Electric Service Sup. Co.	Tractors, Industrial, Electric Baker-Raulang Co.	Trunks, Car Bemis Car Truck Co. Brill Co., The J. G. Cincinnati Car Co. Cummings Car & Coach Co. St. Louis Car Co.	Welded Rail Joints Electric Railway Improvement Co. Lorain Steel Co., The Metal & Thermit Corp. Ohio Brass Co. Railway Trackwork Co. Una Welding & Bonding Co.	Wheel Frames (See Machine Tools)
Tickets and Transfers Globe Ticket Co.	Transfers (See Tickets)	Trunks, Industrial, Electric Baker-Raulang Co.	Welders, Portable Electric Electric Railway Improvement Co. Metal & Thermit Corp. Ohio Brass Co. Railway Trackwork Co. Una Welding & Bonding Co.	Wheels, Car, Cast-Iron Griffin Wheel Co.
Ties, Mechanical Dayton Mechanical Tie Co.	Transformers American Brown Boveri Corp. General Electric Co. Westinghouse E. & M. Co.	Trolleys and Trolley Systems Ford Chain Block & M. Co.	Welding, Rail Joint Ohio Brass Co. Railway Trackwork Co. Welding & Cutting Tools International Oxygen Co.	Wheels, Car Steel & Steel Tire American Steel Foundries Bemis Car Truck Co. Carnegie Steel Co. Standard Steel Works
Ties and Tie Rods, Steel Carnegie Steel Co. International Steel Tie Co.	Tree, Wire Okonite Co. Okonite-Callender Cable Co.	Trucks, Motor International Harvester Co. White Co.	Welding Processes and Apparatus Electric Railway Improvement Co. General Electric Co. Metal & Thermit Corp. National Railway Appliance Co. Ohio Brass Co. Railway Trackwork Co. Una Welding & Bonding Co.	Wheels, Steel Disc Budd Wheel Co.
Ties, Wood Cross (See Poles, Ties, Posts, etc.)	Trolley Bases General Electric Co. National Railway Appliance Co. Nuttall Co., R. D. Ohio Brass Co.	Truss Planks Haskelite Mfg. Corp.	Welding, Rail Joint Ohio Brass Co. Railway Trackwork Co. Welding & Cutting Tools International Oxygen Co.	Wheels, Trolley Bayonet Trolley Harp. Co. Electric Railway Equipment Co. Electric Service Supplies Co. General Electric Co. More-Jones Brass & Metal Co.
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Tools, Track & Miscellaneous Amer. Steel & Wire Co. Electric Service Sup. Co. Hubbard & Co. Railway Trackwork Co.	Trolley Shoe Miller Trolley Shoe Co.	Turntables Electric Service Supplies Co.	Welding Wire American Steel & Wire Co. General Electric Co. Railway Trackwork Co. Roebbing's Sons Co., J. A.	
Torches, Acetylene (See Cutting Apparatus)	Trolley Wheel Bushings More-Jones Brass & Metal Co. Star Brass Works	Valves Ohio Brass Co. Westinghouse Tr. Br. Co.		
Tower Wagons & Auto Trucks J. J. McCordell & Co.	Trolley Wheels (See Wheels, Trolley)	Varnished Papers and Silks Irrington Varnish & Ins. Co.		
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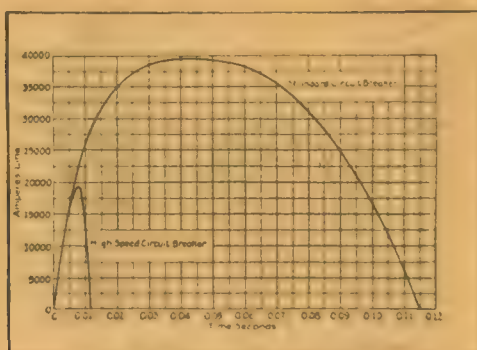
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Vol. 68
No. 22

CONTENTS

Pages
953-992

NOVEMBER 27, 1926

Editorials953

Making Profitable Electric Freight Service a Reality956

Freight containers have been adopted by the Boston & Worcester and the Springfield Street Railways for less-than-carload shipments to and from Boston. Shipments in both directions are now practically balanced. Overnight service is given.

Record of Five Years of Enterprise in Toronto....958

London Subway Extended by Tunneling 959

Five-mile addition to underground system built in ten sections. Accurate surveys required to insure proper alignment. In hard ground shields were driven forward by hydraulic rams, while in soft ground rotary excavators were used.

Seeing What the Motorman Sees.....963

Motion picture displayed by the New York State Railways at the Rochester Industrial Exposition attracted large crowds.

High Current Capacity with Exceptional Flexibility Feature of Catenary.....965

By L. W. BIRCH.
New overhead of Chicago, South Shore & South Bend Railroad gives uniform load of 0.7 lb. per foot on pantograph. Maximum life insured by use of all non-ferrous materials.

Maintenance Notes968

Effective Means of Supporting Armature Coils968

Handling Wheels by a Wheel Stick.....968

Circuit-Breaker Oil Reclaimed Cheaply.....968

Kinks from Decatur, Ill.....969

End Fans Used to Protect Armature from Injury.....969

New Equipment Available970

Dust Kept from Carbon Brushes of Railway Motors.....970

Ticket Printing and Registering Machine.....970

Association News and Discussion971

Iowa Railway Operators Convene.....971

Interspersed with shop talks and more general subjects was the annual convention of the operators' section. Talks on Grand Rapids and an actual demonstration of motor bus oil dilution were features.

Automotive and Railway Men Stage Transportation Meeting973

Co-ordination of highway freight and passenger traffic with existing rail carriers discussed. Design and maintenance problems receive attention.

American Association News974

Cleveland Gets the Convention in 1927.....974

Committee Appointments Announced974

American and affiliated associations make selections for handling the work during coming year. Additional appointments will be announced later.

News of the Industry980

Financial and Corporate986

Personal Mention989

Manufactures and the Markets.....991

Raising the Standards

MODERN industry has responsibility from four points of view, according to Gerard Swope, president of the General Electric Company; speaking at the recent convention of the Associated Business Papers. These responsibilities are from the standpoints of: (1) the public; (2) the employees; (3) the stockholders, and (4) the industry itself.

There is a tremendous job to be done. No intelligent plan can be made without a proper conception of the program and also the facts that underlie that program.

"One of the greatest things that an association of this kind [the A.B.P.] can do," continued Mr. Swope, "is the dissemination of facts to all members of industry. In this the public press, and especially the technical and business press, has a tremendous function. The interpretation of the ethics and ideals of business and of industry to the public can have no better mouthpiece, can have no better spokesman, than the technical and business press."

For 42 years ELECTRIC RAILWAY JOURNAL has bent its every effort toward raising higher the standards of the business press and of the industry which it serves.

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Where they don't "walk a mile" for a trolley!



The more prominent manufacturers in the coach field have accepted Westinghouse Automotive Air Brakes as standard equipment.

The more prominent operators in the transportation field operate Westinghouse Air Braked coaches.

Suburban districts are moving away from your tracks. Your patrons are moving out into the open spaces. Here property is less expensive—living is cheaper.

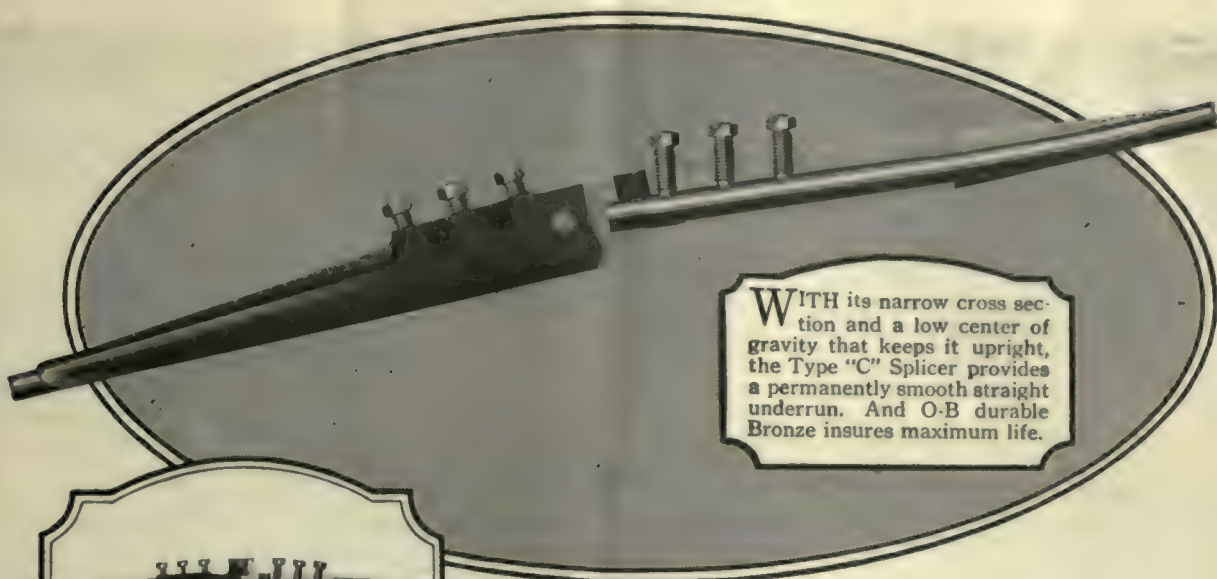
With the saving in expenses and the distance to their friend, the trolley, widening—the temptation of the touring car looms.

Many traction companies, realizing the seriousness of the situation, are going to meet their passengers. Gasoline feeder coaches are filling the breach admirably, with dispatch and safety. Westinghouse Automotive Brakes provide rail security on rubber, making possible the practical use of commodious vehicles.

People thus conscientiously served find the lure of the private car less—because they don't have to walk a mile for a trolley.

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Automotive Division, WILMERDING, PA.

WESTINGHOUSE AUTOMOTIVE AIR BRAKES



WITH its narrow cross section and a low center of gravity that keeps it upright, the Type "C" Splicer provides a permanently smooth straight underrun. And O-B durable Bronze insures maximum life.

THE Type "C" Splicing Ear has all the qualities of the "C" Splicer. In addition it has a boss for suspension at the span or bracket arm.

TYPE "D" Trolley Wire Splicer combines great strength and long life with good clearance for the trolley wheel. Used especially on heavy city or inter-urban lines.

TYPE "D" Splicing Ear is similar to the "D" Splicer but is provided with a central boss for attachment to span or bracket arm.

THE Improved Clark Splicer is substantially designed but has not all the advantages of the Type "C" Splicer. Used where low first cost is the chief consideration.

THE Clark Splicing Ear is similar to the Splicer, except that it is provided with center boss.

First Aids to Service in Winter Weather

WHEN cold weather has set in and old man Winter tightens up the overhead as taut as a fiddle string, trolley wire breaks are bound to occur in many places where wear has weakened the section.

But wire breaks need not tie up traffic for any length of time—and wire breaks need never occur twice in the same place—if you have a stock of O-B Splicers on hand, ready for use in just such emergencies.

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INSULATORS
LINE MATERIALS
RAIL BONDS
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VALVES

AS LOGICAL AS THE BALANCING OF SCALES



To obtain the unknown weight of an object, by balancing it with known weights was one of the earliest scientific developments. This principle of equalization of forces has had countless practical applications. It is logical.

In the modern railway clasp brake, equal pressure is applied to opposite sides of each wheel, through standard brake shoes, whereas the ordinary practice is to apply the force to one side only. The clasp brake, or balanced braking system, neutralizes the tendency to one-sided wear on journal bearings, pedestals and other truck parts. It affords smoother braking with less heating of brake shoes, and reduces the number of "slid-flat" wheels.

In short—it is the modern and scientific braking system—which is finding increasing favor for heavy traction, and rapid transit service.



AMERICAN MULTIPLE-UNIT
CLASP BRAKES

AMERICAN STEEL FOUNDRIES
NEW YORK CHICAGO ST. LOUIS



Relaying Track Without Inconveniencing Riders

Night work is not uncommon with electric railway maintenance employees, as they must continually make repairs and replacements or install new construction without interfering seriously with car service. Ingenious methods must be devised and work planned carefully to the minutest detail so that car riders will not be inconvenienced. The above illustration shows how track on Euclid Avenue in the downtown section of Cleveland

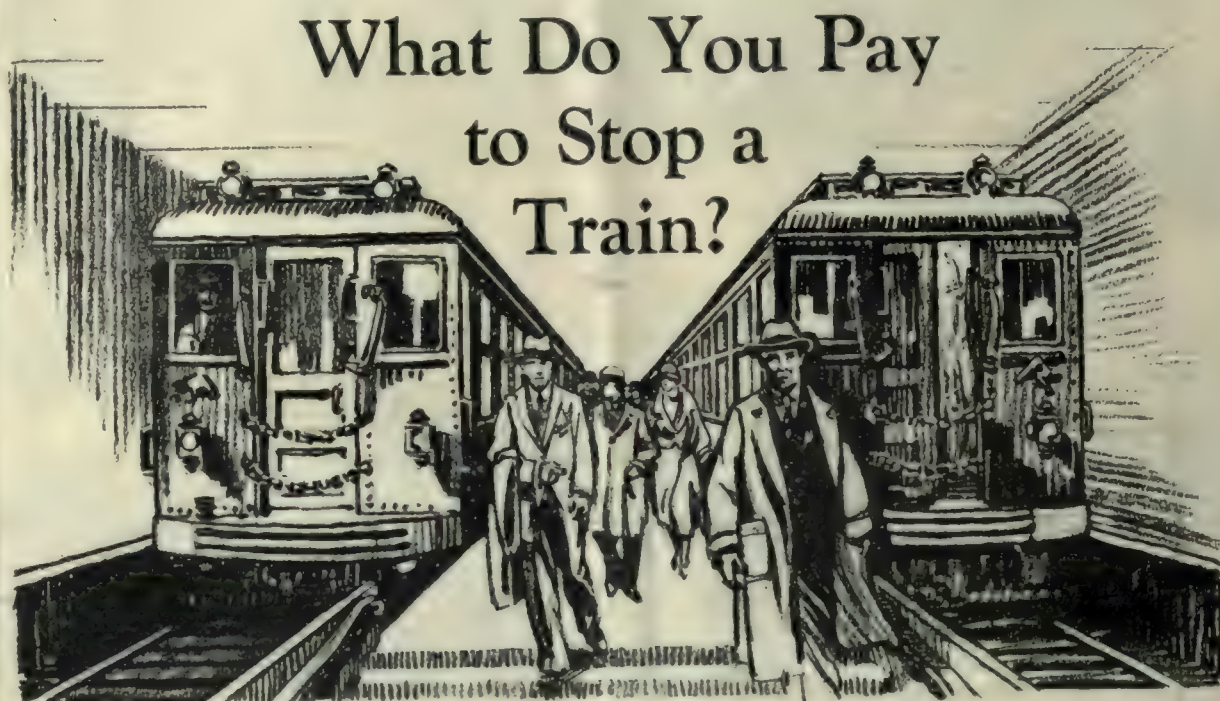
was relaid at night. Floodlights installed in the overhead produced the illumination. New rail was laid on an old concrete base using, of course, *Steel Twin Tie Track*. In this installation, flat bars instead of channel connections between bearing plates were used.

May we send you detailed information on "Steel Tie Track Construction," cost figures, and delivered price on Twin Ties?

THE INTERNATIONAL STEEL TIE CO.
Cleveland, Ohio

Steel Twin Tie Track

Renewable Track — Permanent Foundation



YOU burn coal or other fuel to obtain the heat or energy that *starts* the train. To stop the train, in turn, this energy must be converted back into heat through brake shoe friction. Do you measure the cost of brake shoes as carefully as that of coal? High grade coal does more foot pounds of work per pound of fuel. High grade brake shoes do more foot pounds of work per pound of metal. While American Brake Shoes may cost a little more to start with, their use makes it cost less to stop a train.

"Best by Test"

THE AMERICAN BRAKE SHOE AND FOUNDRY COMPANY

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*Above—co-ordinated service for transportation
Below—consolidated service for equipment*

Many electric railways have co-ordinated car and bus service. To meet the buying demands of these companies for a central purchasing point we have a complete line of equipment for both car and bus—Keystone Equipment.

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Hunter Illuminated Signs
Faraday Bells and Buzzers
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Golden Glow Bus Headlights
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Lighting Fixtures
Signal Keys, Pull Switches
and Door Switches
Employees' Badges
Fare Registers and Fittings
Hunter Bus Ventilators
Keystone Bus Ventilators
"Storm King" Windshield
Cleaners, Mirrors, Wear-
proof Mats, and other
miscellaneous equipment.

Ask for
ESSCO Catalog No. 9

Legible signs, which clearly distinguish route and destination, adequate illumination, powerful yet non-glaring headlights, convenient push buttons and buzzer signals, these are but a few of the many Keystone devices. All are designed to meet the particular conditions of railway or bus transportation.

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Hunter-Keystone Signs
Faraday Bells and Buzzers
Faraday Push Buttons
Golden Glow Headlights
"Safety" Lighting Fixtures
Fare Registers
Keystone Gear Cases
Keystone Trolley Catchers
Trolley Wheels and Harps
Trolley Poles,
Etc.

Ask for
ESSCO Catalog No. 7

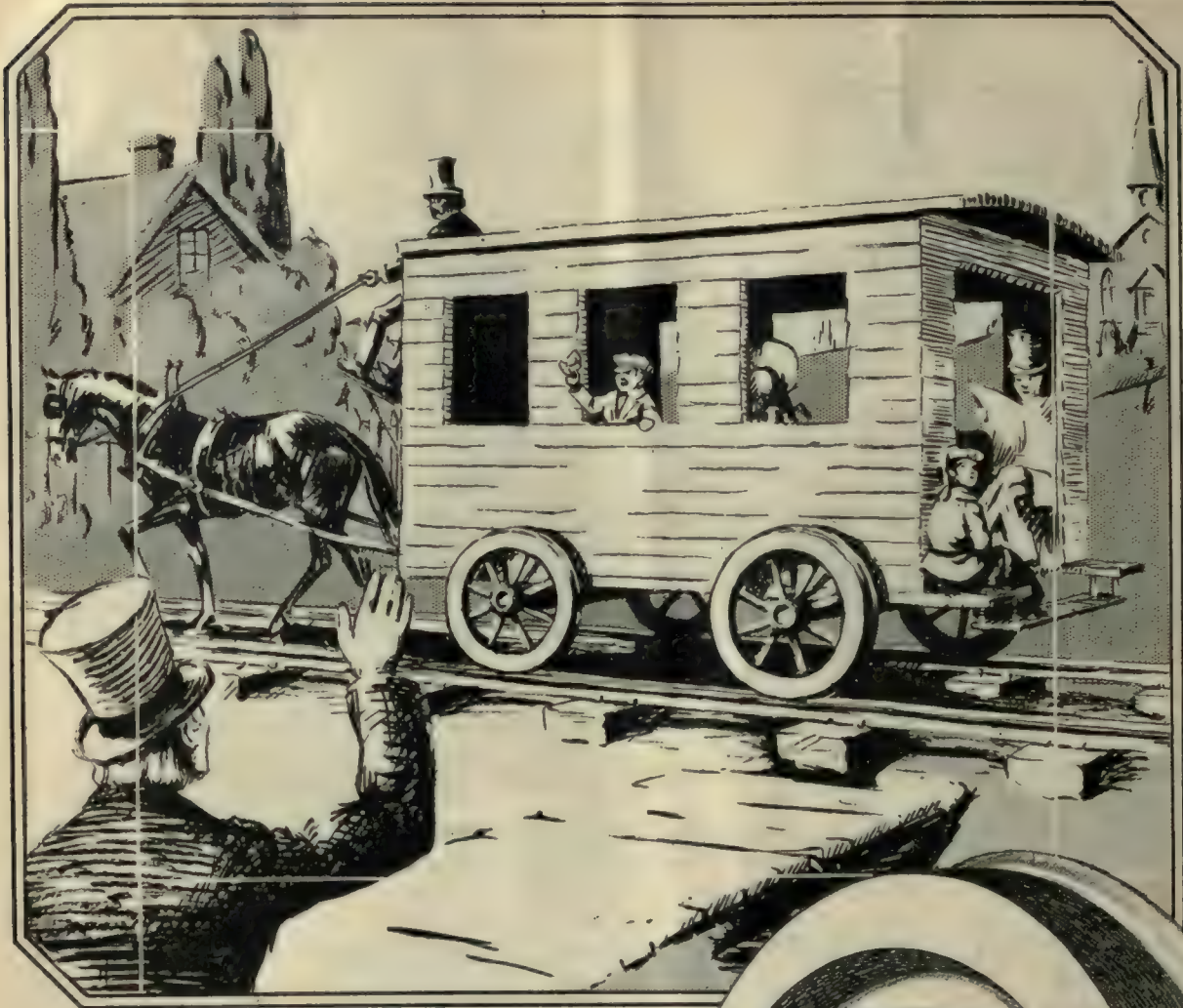


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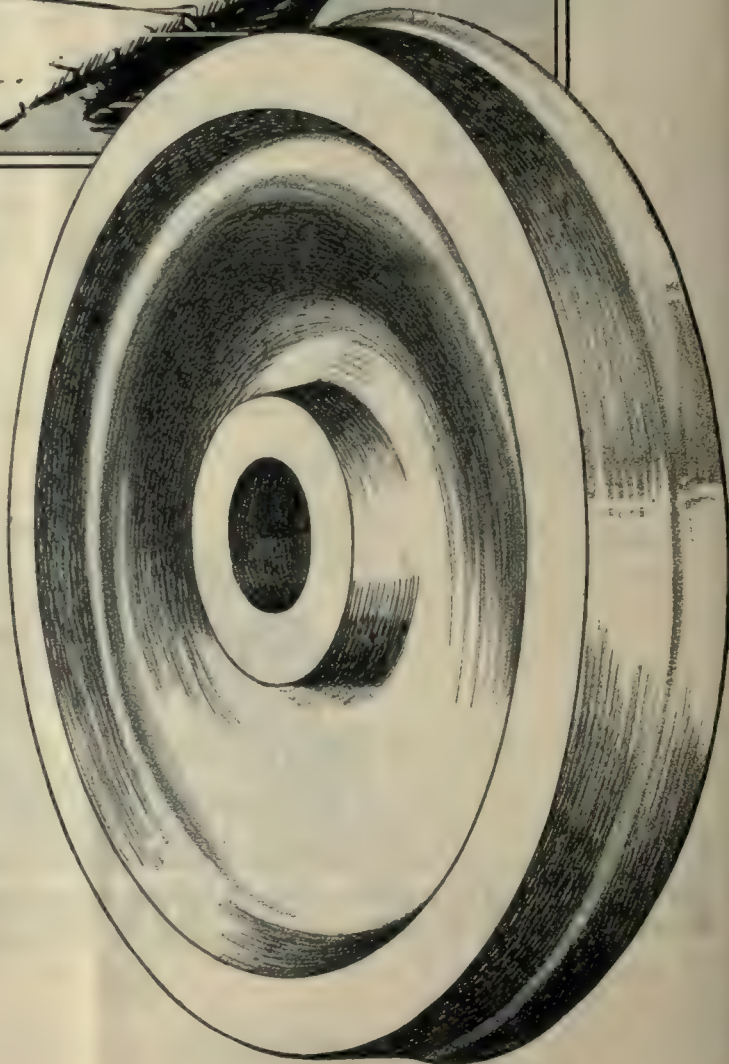
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Heavy traffic, more congested streets, greater loads, more acute peak periods, more frequent starting, more sudden stopping—all spell the need for safe, dependable equipment—

..... which is simply another way of saying Gary Wrought Steel Wheels.

Illinois Steel Company

208 South La Salle Street
Chicago, Illinois





Feeding Hills



VICINITY

SPRINGFIELD AND VICINITY

MAP SHOWING LINES OF
SPRINGFIELD STREET RAILWAY CO.



1924

*first one **YELLOW COACH**
then fourteen more*





The { No. 99 }
YELLOW COACH
*whose performance started
the ball rolling ~ ~ ~*

"Number 99" it is listed on the books of the Springfield Street Railway Company, Springfield, Mass.

"Number 99" is a 29-passenger, four-cylinder Z type; the first Yellow Coach the Company purchased, April 16, 1924. Since then, fourteen more Yellow Coaches have been added to the fleet. On November 30, 1925, eight 29-passenger YZ and three 21-passenger X type coaches were ordered. Another X type was purchased April 20, 1926, and this order was followed later, on July 15, 1926, with ten 29-passenger YZ's. The entire equipment is used for city operation.

"Number 99" set the performance pace for the others to follow, and its owners point to its record with pride.

YELLOW COACH PERFORMANCE WINS
for the **SPRINGFIELD STREET RAILWAY**

Only after piling up 53,000 miles was any work done whatever on relining or servicing the brakes. And only after it had run 72,000 miles (two years of steady service) was it necessary to overhaul it. Then only \$10.09 was expended for replacement material. Front and rear axles were found in perfect condition. Engine inspection showed bearings and piston pins O. K. On October first, 1926, "Number 99" had traveled 80,000 miles. During 1925 it clocked 41,982 miles in 4473 bus hours, carried 167,753 passengers and earned a net income per mile of 1.46 cents after every possible expense had been figured including depreciation, insurance, registration, taxes, interest, clerical work, stationery and many items not usually figured.

Despite this load, "Number 99" came through, paving the way by its splendid performance for the fourteen other Yellow Coaches now included in the fleet.

Four routes are served in Springfield. Orange Street line, with a round trip mileage of 8.4. Dickins Street, with a mileage per round trip of 5.4. Boston Road route, with a round trip mileage of 8.9. Armory Street line, 5.9 round trip.

Over these four routes Yellow Coaches are daily demonstrating the value of *low-cost*, profitable miles and faithfully following the example set by "Number 99."



COMPANY, *Springfield, Mass.* ~



Look behind the Insignia!

Consider what is behind the insignia on the hood of the motor coaches you buy. Does it protect you from the danger of "orphan equipment"? What does it stand for in the way of financial stability? What is back of it in the way of transportation experience—research—manufacturing facilities?

The Yellow Coach insignia stands for the greatest value in equipment plus resources, financial and otherwise, which only the welded efforts of Yellow Coach and General Motors can give.

Look behind the insignia!

YELLOW TRUCK & COACH MANUFACTURING CO.
SUBSIDIARY GENERAL MOTORS CORPORATION
5801 WEST DICKENS AVENUE, CHICAGO, ILL.



NATIONAL THANKSGIVING

THERE are many cities which have reason to be thankful for a modern and efficient transportation system. We are thankful that the National Pneumatic Door and Step Equipment has not only played a part in building up efficient service but that it has

developed in a way to meet each new requirement in traffic handling. In the half a hundred cities shown above, for instance, need was felt for operation of the circulating load in one-man service and the National Pneumatic Automatic Treadle Door has solved this problem satisfactorily in every case.

NATIONAL PNEUMATIC COMPANY

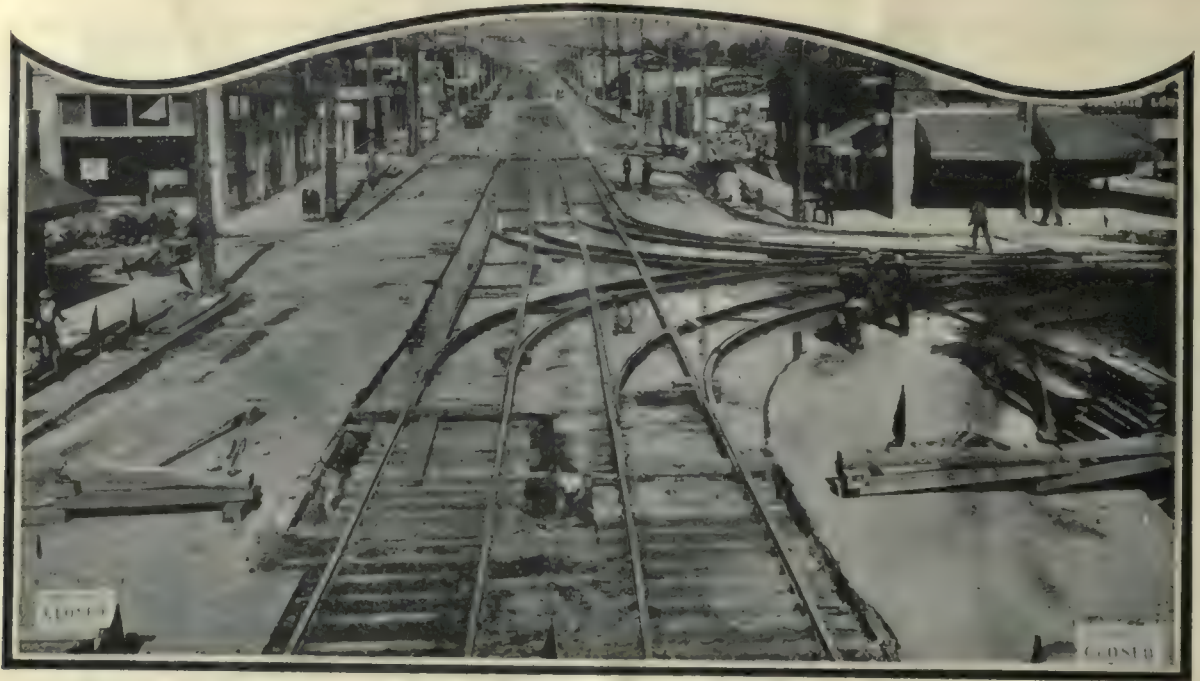
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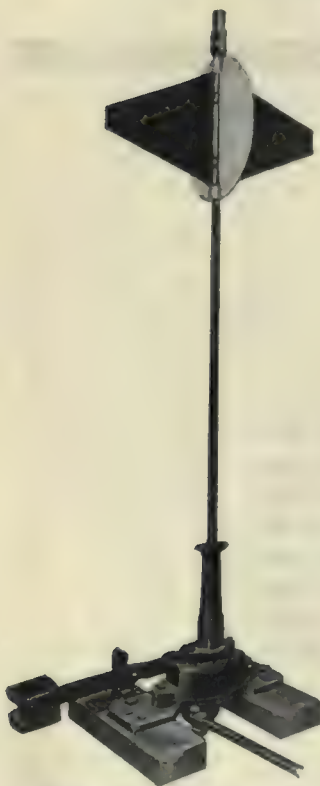


Bethlehem Track Specialties *for Electric Railways*

Special Trackwork; Tee and Girder Rails; Special Splice Bars for Welding; Machine Fitted Joints; Abbott and Center Rib Base Plates; Tie Rods; Bolts; Pole Line Material; Rolled Steel Wheels and Forged Axles.

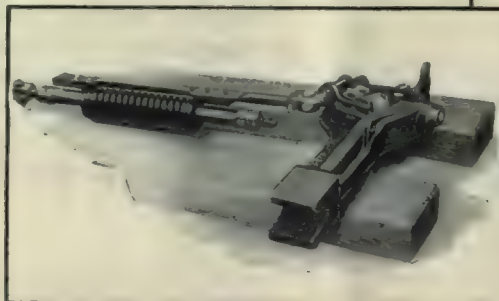
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Special Trackwork and Layouts



Switch Stand, Model 51-B

Switch Stand, Model 1222



Brace Tie Plate
Design 804

BETHLEHEM STEEL COMPANY, *General Offices:* BETHLEHEM, PA.

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BETHLEHEM

Operating expenses reduced 5.2 cents per car mile!



The Northampton Transit Company of Easton, Pa. found it difficult to make ends meet, four years ago. Today this road,—one of the smaller interurbans,—is in very satisfactory condition.

Progressive management saw the opportunity and modernized with Cincinnati Balanced Lightweight **NEW** Cars.

These weigh a full third less than the old equipment. They are averaging lower than 2 kw. per car mile in territory, where grades run to 10 and 12

per cent. They have effected a total saving of 5.2 cents a car mile in operating cost. And they have already reduced maintenance of way and structures cost by 1.2 cents a car mile.

It just shows what can be done where every detail of new car design and construction is carefully *Balanced* to meet specific operating conditions.

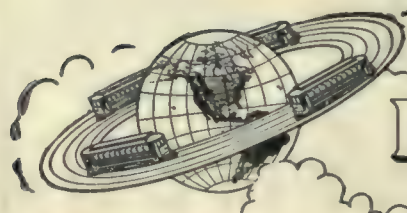
Let us explain this basic principle of *Balanced Design* in detail. The results of its application have *invariably* proved satisfactory.

THE CINCINNATI CAR COMPANY
CINCINNATI, OHIO

CINCINNATI *New* CARS

A step ahead of the modern trend

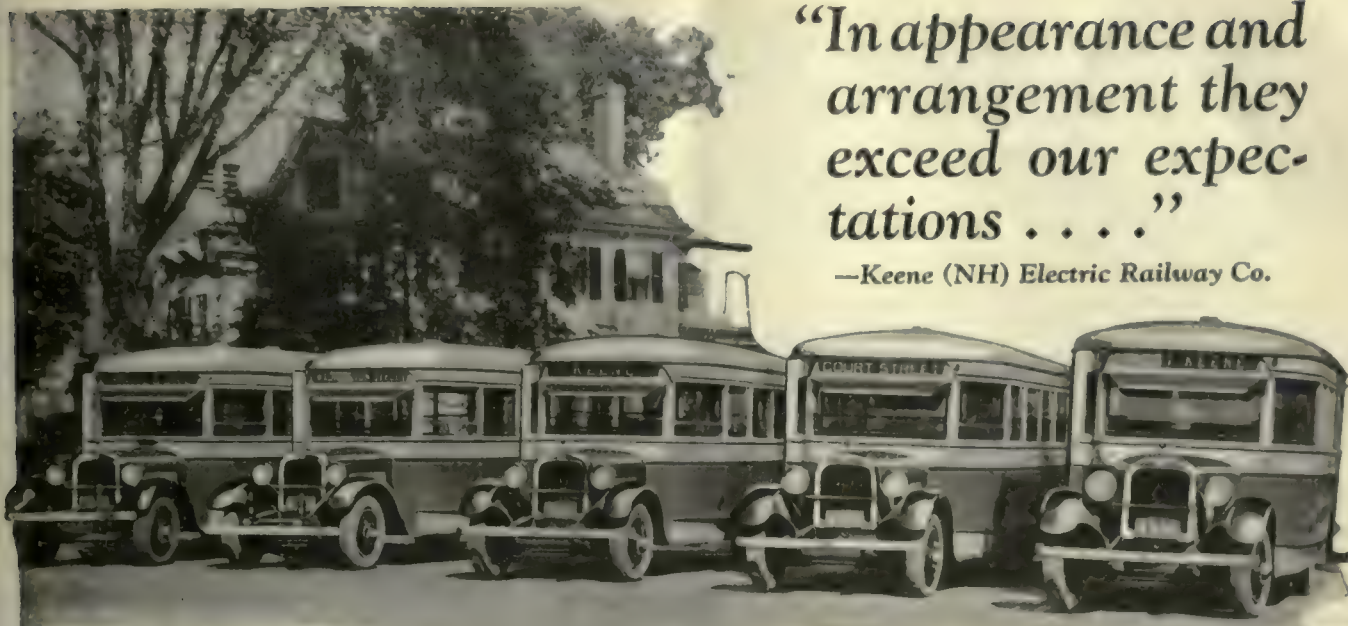
The creation and maintenance of car advertising space values requires the same degree of highly specialized knowledge as the construction and maintenance of railroads. Such tasks should be delegated only to those of widest experience and longest record of success.



Barron G. Collier

INCORPORATED

CANDLER BLDG. NEW YORK



"In appearance and arrangement they exceed our expectations"

—Keene (NH) Electric Railway Co.

More and more street railways, like the Keene Electric Railway Co., find Graham Brothers Motor Coaches fit their needs exactly.

They look well. They are dependable. Quality is high, initial cost low, operation and maintenance inexpensive. Riders appreciate their comfort.

Mounting sales of the 21-passenger street car type continue to reflect the trend towards medium capacity motor coaches.

With Dodge Brothers Dealers everywhere, reliable service is always available. The dealer near you will give you any information on Graham Brothers Motor Coaches.

PRICES—21-Passenger Street Car Type, \$3815;
12-Passenger Parlor Coach, \$3750, f. o. b. Detroit.

GRAHAM BROTHERS MOTOR COACHES

SOLD BY DODGE BROTHERS DEALERS EVERYWHERE



One of the Goodyear-equipped fleet of Interstate Stages, Inc., operating daily between Detroit and Chicago

GOODYEAR

Copyright 1926, by The Goodyear Tire & Rubber Co., Inc.

"Freedom from Tire Failures en Route"

When you have a 280-mile bus run, such as Interstate Stages, Inc., of Detroit, has daily between Detroit and Chicago, you want tire equipment that provides utmost dependability en route.

Mr. E. A. Blake, President of Interstate Stages, Inc., writes that his line has found that equipment in Goodyear Balloon Bus Tires. Mr. Blake's letter reads as follows:

"We have received numerous unsolicited testimonials from people who have enjoyed the riding qualities of Goodyear Balloon Bus Tires, which are standard equipment on all our Fageol Safety Stages, operating daily between Detroit and Chicago, a distance of 280 miles.

"This type of tire has more than met our expectations and is giving wonderful service and freedom from tire failures en route.

"This, in conjunction with their sure-footedness on slippery roads, combined with our air brakes, has earned us the reputation of being the safest and most dependable motor transportation service between these two points."

* * *

You can always depend on Goodyear Tires for active, tractive, economical service on any road.

They are durable. They cushion. And they cost less per tire mile.

* * *

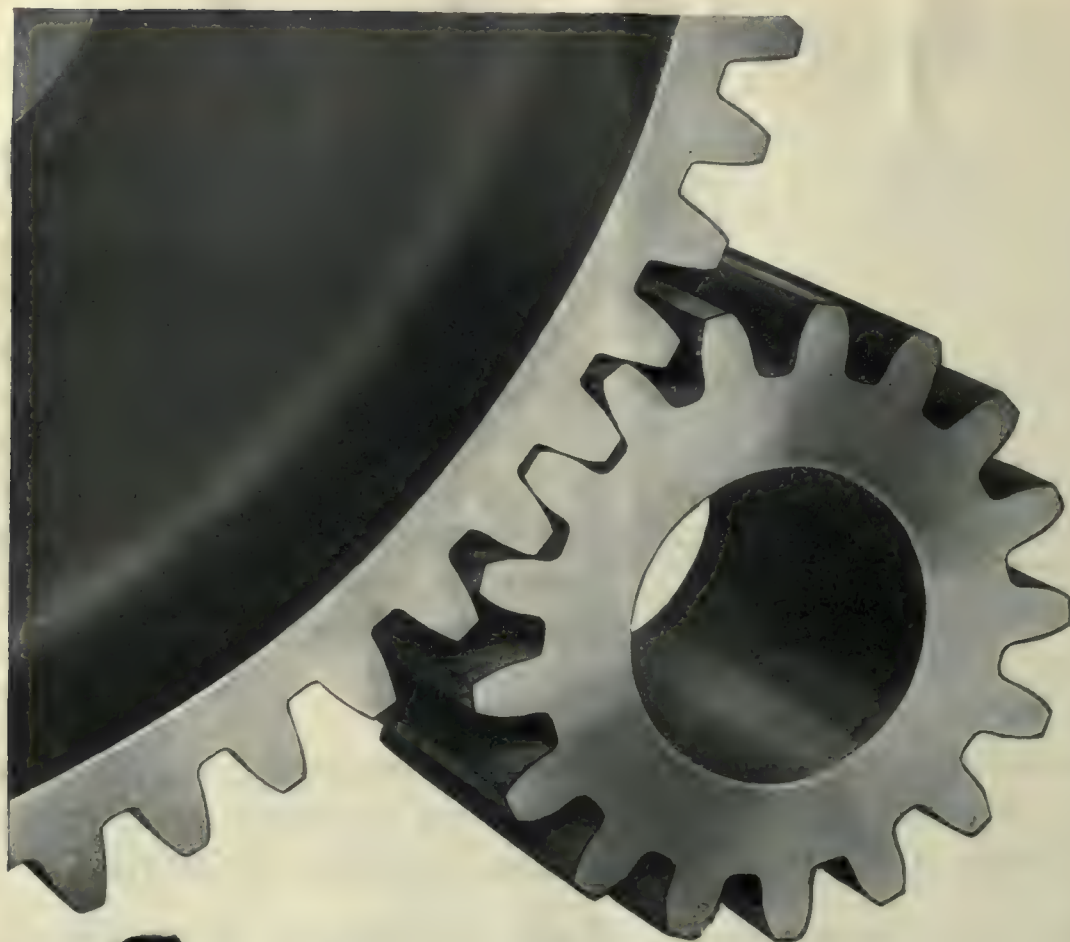
Made with SUPERTWIST, the extra-elastic, extra-enduring fabric developed by Goodyear for Goodyear Pneumatic Tires. Goodyears provide for any motorbus service the last word in bus tire value.

Only Goodyear Tires are made with SUPERTWIST—yet they cost you no more.

*More people ride on Goodyear Tires
than on any other kind*

BUS TIRES

Made with SUPERTWIST



Say "Grade M"

Quicker starts and more powerful braking are both needed to keep electric railway cars abreast with the other street traffic. These modern schedules impose operating conditions that send many an ordinary gear or pinion to an early rest on the scrap pile.

Depend upon the gearing which has proved its reliability.

Specify "Grade M".



General Electric has carried its research work in metallurgy, its testing and heat-treating processes on gearing, to the point where a product like the Grade M Gear and Pinion can be installed with absolute confidence.



For
Modern Equipment Standards

GENERAL ELECTRIC

Electric Railway Journal

Consolidation of Street Railway Journal and Electric Railway Review

Published by McGraw-Hill Publishing Company, Inc.

CHARLES GORDON, Editor

Volume 68

New York, Saturday, November 27, 1926

Number 22

The 1927 Convention Goes to Cleveland

BY UNANIMOUS vote, the executive committee decided to hold the 1927 annual convention of the American Electric Railway Association in Cleveland provided that satisfactory arrangements can be made with the convention committee of that city. All signs indicate that such arrangements will be made, not the least of which is the fact that J. H. Alexander is the chairman of the Cleveland convention committee with an evident determination to meet the association more than half way in working out any details that may be necessary to the completion of the negotiations. That Colonel Alexander, together with the late Mr. Stanley and the Cleveland Railway, met the association and the industry more than half way last year is appreciated by every one who went to Cleveland.

Despite the heroic work of the Cleveland Railway and its organization, there were some criticisms of the arrangements and facilities during the last convention. These centered chiefly about the hotel accommodations, telephone service and location of meeting rooms. The committee on location put these facts squarely before the representatives from Cleveland in discussing the arrangements for next year. It was apparent that the Cleveland hotel men did not quite understand the caliber of the men who go to the American Electric Railway Association conventions and had not planned adequately for their accommodation.

But the temper of the Cleveland people is well illustrated by the fact that satisfactory arrangements to overcome the objections of the location committee were laid before the executive committee the very next day. Cleveland wanted the convention to return to the shores of Lake Erie, and was prepared to make every necessary concession to bring it there. This did not seem to be true of Atlantic City. Although the natural attractions of the famous seaside resort were considered superior to Cleveland, there seemed to be no satisfactory way of providing for an adequate car exhibit. The best that could have been done would have been to go through a laborious and expensive process of skidding cars into place on the boardwalk and stringing them along the rail from the Million Dollar Pier toward the inlet.

These and many other factors connected with the two convention locations were considered. The newspapers in Cleveland gave a degree of co-operation seldom experienced during a convention of the association, both as regards the local space devoted to the convention activity, and the amount of material sent out to the country over press association wires. The greatest car exhibit which the industry has ever held was made possible only because of the prominent place given to the exhibit in the center of convention activity, to the

space available for the cars and to the wholehearted co-operation of the Cleveland committee in urging both manufacturers and operators to send cars to the show.

Every one who went to Cleveland seems agreed that the evidence of car progress shown there stimulated new interest and enthusiasm throughout the industry. There was likewise a feeling that this was only the beginning of a momentous development in the direction of improved car facilities and better electric railway service. This showing of car improvements, combined with the records of accomplishment on the properties which have succeeded in building revenue and reducing costs through the use of modern equipment, carried new hope and inspiration to every property in the country.

Thus in capitalizing on this new spirit and setting out to exceed the showing of the last convention by providing the facilities for an even bigger and better car exhibit the executive committee has acted wisely in again selecting Cleveland for the 1927 convention.

Mr. Insull Fixes Responsibility for Transportation Difficulties

A FRANK statement of the effect which political manhandling has had on the development of transportation in Chicago was made by Samuel Insull in an address before the Electric Association of Chicago on Nov. 18. Coming as it does from the man who has had as much to do with the establishment of utility financing on a basis to command public confidence as any single individual in the country, Mr. Insull's direct indictment of local politics on the score of destroying the investor's confidence in transportation securities was supported by figures which tell their own story.

Various branches of the electrical industry in Chicago attracted for development and extension \$137,500,000 during the year ending June 30, 1926. Of this amount only \$14,000,000, or approximately 10 per cent of the total, was expended for the improvement of electric railways, although the electric transportation investment in the Chicago district exceeds by \$50,000,000 that of any other group of electrical enterprises. Even this comparatively small proportion of new money was divided between the various transportation systems almost in direct proportion to their susceptibility to political interference.

Chicago is not the only city in which the transportation system has been a political football. Automotive competition, high taxes, paving charges and many other difficulties may be contributing factors to the investors' coolness toward electric railway securities. But the primary agent in driving money away from the development of transportation facilities has been the unscrupulous politician who while shouting about

"traction barons" has destroyed the value of securities into which the savings of millions have been invested in good faith and has held back transportation development in practically every city in the country.

Chicago today presents the ultimate spectacle of what political chicanery can do to sound utility investments. In the case of the Surface Lines properties, whose franchises expire in February, 1927, there can be no question of management. Here for once in transportation history the issue becomes clear cut. Even the politicians themselves admit the efficiency of the operations, and the public has been given the utmost in service, despite the pending critical financial situation. In the face of severe franchise requirements which include all the objectionable indirect taxes on the car rider that could be devised in the form of street cleaning, paving, etc., 55 per cent of the net receipts of the property has been needlessly taken out of the pockets of car riders to build up a fund in the city coffers. Despite all this, and with a comparatively low rate of fare and the most liberal transfer privileges of any city in the country, the operations make a favorable financial showing.

Measured on the basis of the company's showing as a business enterprise, investment in Chicago transportation securities should be sound. But this is not the fact. All signs point to a receivership when the present bonds become due, because of the impossibility of refinancing under existing conditions. When this comes it might well be termed a political receivership.

Bad as is the Chicago situation from the investor's standpoint, it may prove to be not an unmixed evil in the long run. There is promise in this situation that the part played by political meddling in the retardation of transportation development will be forcefully brought home to the public at large. In that event it may prove to be the means of awakening the public mind to the changed conditions which have come about in local transportation and definitely fixing the responsibility for failure of transportation facilities where it belongs—on the shoulders of politicians who talk much and know little about the subject.

The Metropolitan Section Takes a Forward Step

AT ITS recent meeting in New York the Metropolitan Section of the American Electric Railway Association took a long step forward in stimulating co-operation between various factors in the industry by the election of T. R. Langan of the Westinghouse Electric & Manufacturing Company to its presidency.

This is a decided break with precedent in the conduct of electric railway association affairs. In few industries does the manufacturer play so important and intimate a part as is the case in the electric railway industry. When the operator is in difficulty he does not hesitate to call in his manufacturer friends. Nor do they hesitate to lend a degree of helpfulness which exceeds by a wide margin the limits of ordinary commercial service.

In association activity the manufacturers have played an important and helpful part. Does some new association activity call for the raising of additional money, the manufacturers are always ready to do more than their share. Does a program require a speaker who is a specialist and an expert on a given subject, a manufacturer's representative may be counted on to prepare

a suitable paper. Does it become necessary to make arrangements for a meeting and to prepare an appropriate entertainment program, a committee of manufacturers is always willing and glad to give the time and effort necessary to work out the details.

Recognition of the good work done for the Metropolitan Section by Mr. Langan is very fittingly expressed by his election to the post of president. It is to be hoped that this is the beginning of a more general recognition by the industry of the aid extended by its manufacturers, and that other bodies will likewise give consideration to this auspicious move in opening wider the doors of association office.

The Least of Many Evils Is a Poor Decision at Best

FOOD for much thought is contained in the remarks of Thorne Brown before the banquet meeting of the Iowa Electric Railway Association held recently at Omaha. He apparently reflects the discouragement that engulfs this section of the country at the present time. From his background as chairman of the Nebraska State Railway Commission Mr. Brown is in position to know of the dwindling revenues and of the serious condition of many of Nebraska's railways. He paid high tribute to the Omaha system, and yet pointed out that through lack of public understanding this city has but recently refused the company a new franchise even though the present franchise expires in 1928 at the same time the principal bond issues become due.

The statement made by Mr. Brown that perhaps municipal ownership was the way out was a sad commentary on the business sense of Omaha and of those in control of its political life. Mr. Brown is not a municipal ownership enthusiast. He frankly states that one of the prices that Omaha or any other city will have to pay under municipal ownership will be poorer service and less courtesy. He suggested this plan only because he has exhausted in his mind all other possibilities and comes at last to government ownership as perhaps the only port left in a bad storm.

Certainly Mr. Brown realizes the need for adequate transportation in Omaha. He realized it as a member of the state commission, but the need has been even more forcefully borne in upon him as industrial commissioner of the Omaha Chamber of Commerce, to which post he was recently appointed. Omaha is ambitious. It is not content to stand still industrially. It wants new industries. Omaha, however, must first care for its present industries before it can expect to attract new ones. Omaha can hardly extend the glad hand of welcome to other industries at the same time that its railway bespeaks in its physical aspects the niggardly policy that has characterized its dealings with its street railway. Omaha is to be congratulated on its aspiration, but it is hardly to be congratulated on its acts—at least its acts in so far as they affect its street railway. If Omaha would escape the fate of municipal ownership that Mr. Brown appears to see ahead for it, then the responsible business interest of the city should set about the task of freeing the railway situation from political bickering. That cannot be accomplished until the communities involved realize that it is part of their responsibility to see that the utility is so treated that it may become a community asset.

Insurance Committee Deserves Support of the Industry, Based on Past Performance

CAREFUL perusal of the last insurance committee report of the A.E.R.A. gives the impression that the information contained is of more than ordinary significance. In the first place, embodied in the report is a two-year history of the fire insurance experience representing two-thirds of the capitalization of the industry—perhaps the most complete analysis that has ever been made of this important element of operating expense.

Secondly, it is observed that an average of 31.92 cents was paid for every \$100 of the \$670,000,000 of insurance carried by the 304 reporting companies. The premiums paid are the sizable total of \$2,140,000 annually. Prorating this for the entire industry it is safe to say that at least \$3,000,000 is paid out each year to safeguard investment against loss from fire. An interesting sidelight is that the premiums of individual reporting companies ranged between the limits of 10 cents and 60 cents per \$100.

In 1924 the average rate was 35.05 cents per \$100, so that the reduction of 3.13 cents obtained in 1925 represents something more than \$200,000 saved in premiums. But is this enough? Of the \$2,304,000 paid out in premiums in 1924 by 304 companies, \$1,312,000 or 56.93 per cent was recovered in fire losses. Compare this with the \$2,140,000 premium in 1925, out of which only \$607,000 or 28.38 per cent was reported as recovered through fire loss. What has happened? It certainly does not take more than 70 per cent to do insurance business.

What stands out as of greatest significance is that in 1925 the fire loss was less than half that of 1924. Evidently the combined efforts of committees and insurance companies have resulted in improved construction and lessened fire hazards.

There is, perhaps no class of fire risks that should be better than electric railways. Many factories, office buildings, and similar fire risks are vacant the greater part of the day as well as on holidays, watched over during these periods only by poorly-paid and oftentimes pensioned employees. Contrast this with the electric railway properties that are actively working at all hours, actually performing a major service eighteen hours a day and often 24 hours a day for 365 days a year. This very situation keeps many employees constantly on the premises where they are always available to report or fight fires. It is almost inconceivable that a sizable fire could gain great headway unnoticed.

Then, also, is the question of exposure, one of the greatest elements of fire hazard. By virtue of necessity the major fire risks of railway properties are located at points remote with respect to the congested areas.

Insurance at best can only cover the capital invested. Payment in full for a loss due to a major conflagration would be poor compensation to a public depending on an essential service, just as it would be to the company that would have to wait from three to five months for replacement equipment.

All of these arguments are combining to make the fire hazard less and less. The committee has done a notable work in obtaining the data and setting forth the facts. Its work this year will be commendable if only another year is added to this enlightening history.

Co-operation of companies is needed. Why did the missing third hold out the information last year? Was

it through shame, fear or just a desire for blissful ignorance? Ultimate good is the only net result that can accrue through a statement of facts, and the insurance committee has proved itself deserving of painstaking efforts on the part of companies in the prompt reporting of insurance experience.

Constant Turmoil Accomplishes Little Good

ONE is sometimes led to wonder whether a few railway managers are not so carried away with a determination to prevail in their position on a disputed question, as to lose sight of the ultimate objective for which the cudgels were taken up—the best interests of the security holders. In the case of a certain railway property whose affairs have long been a source of bitter contention, nothing short of a 10-cent cash fare would seem to be acceptable. This management has not lost sight of the coveted goal for an instant in recent years. In line with this policy, a value five times as great as that fixed by the Public Service Commission for rate-making purposes is claimed for the railway property. Although the bonds outstanding exceed the commission value only by one-seventh in amount, and although the outstanding capital stock is only about two-thirds the amount of the bonds, the company seems to recognize nothing anomalous in its attitude. In support of its avowed demands, it has evoked the aid of the courts. But it has effectively alienated the regard of the public and the representatives of the public elected to office.

There is apparently no likelihood of default in bond interest. Still, some of the bond issues farthest removed from being a direct lien on tangible property are selling at a discount which approximates quotations for similar securities either in actual or technical default. This, of course, is a reflection of the insecurity of the company's present public position. It would no doubt be difficult and it might even be impossible to bring about a voluntary readjustment and a scaling down of capitalization more nearly in keeping with the proved earning capacity of the property in recent years. Perhaps that is not necessary, but it does appear to be the height of folly to insist upon a predetermined rate of fare under conditions that make it extremely unlikely that any increase in gross earnings would result. It is, of course, always distasteful to surrender as a matter of expediency rights to which one justly feels entitled; but it often happens that rights to which one thinks he is entitled are merely the shadows of the real thing and are obligations rather than assets.

The case here cited is not a supposititious one, but it is an isolated one. Problems no less difficult than those that beset this company are being successfully surmounted in other communities. There is ample reason for believing that the energy expended by this management in battling for what it construes as its rights would, if directed to the development of the system and the sale of service to the public, have won for the company respect that is now almost totally lacking, and even the coveted 10-cent fare, if that really proved to be necessary and desirable. This company has for too many years been a public storm center. It could, perhaps, achieve its ends better by being more persuasive and less pugnacious. A public utility may, through unforeseen and unavoidable circumstances, fall into temporary difficulty; but there is something wrong with a utility that is in constant disrepute.

Making Profitable Electric Freight Service a Reality

Freight Containers Have Been Adopted by the Boston & Worcester and the Springfield Street Railways for Less-than-Carload Shipments to and from Boston—Shipments in Both Directions Are Now Practically Balanced—Overnight Service Is Given

Using a Small Electric Truck to Unload the Containers Makes It Possible to Dispense with the Services of All but One Man



SHORT-HAUL, pick-up-and-delivery service for assorted freight in small lots, generally classified as l.c.l. shipments is unprofitable from the viewpoint of carriers of the greater portion of the country's tonnage; the steam railroads. The conditions that preclude the possibility of profit to the steam lines do not hold in equal degree with the interurbans. The items mentioned, together with guarantee in transit and rapid delivery, do, however, impose on the electric lines the task of devising methods and practices that will enable the business to be handled on a profitable basis.

That it is possible to work out a satisfactory system is shown by the experience of the Boston & Worcester Street Railway and the Springfield Street Railway in establishing a profitable through freight service connecting Boston and Worcester and Springfield. This has been accomplished by dint of an intensive campaign carried on among distributors in Boston and producers in the territories surrounding the two cities farther west to sell the transportation services of the electric railways in connection with the use of freight containers.

The total distance between Boston and Springfield is approximately 100 miles, this mileage being divided about evenly between the two companies. It has been found by these railways, after their experiences with the handling of the containers, that short-haul electric freight service has reasonable possibilities of profit, provided that freight carrying by all forms of public

transportation with particular reference to trucking companies, be regulated as to schedules, tariffs and responsibility on a basis similar to the provisions under which the railway must operate.

Beginning on July 1 sixty standard freight containers leased from the Freight Container Company of Boston, were adopted by the two railway companies, with a view to promoting their use for shipments in less-than-carload lots. It was felt that with these containers it would be possible to eliminate many of the non-productive factors which have hitherto rendered electric freight haulage an unprofitable venture.

The containers are moisture-proof, strong, portable boxes, equipped with either refrigerating or heating equipment, according to the requirements of the shipper. They are 8 ft. long, 7 ft. wide and 6 ft. high and each one is capable of holding 5 tons of freight. They may be easily manipulated into place, it being possible for two men to push them on or off a car, but the companies have found it economical to use a small motor truck for shifting as this practice eliminates one man. The containers slide into place on a standard flat car, five to a car.

Actually, the railway companies do not undertake to pick up or deliver the containers. The Freight Container Company, through its agents in the various cities served, handles this entire phase of the work, the containers only coming under the care and responsibility of the railways when they are delivered to the freight

sheds in Boston, Springfield and Worcester. The shipper packs the containers on his own platform at his plant and they are then picked up by the Freight Container trucks and transported to the freight depots. The railways simply are responsible for the containers and their contents to the extent of loading them onto their flat cars, transporting them from city to city and unloading them at the other terminals.

Since Boston is the natural distributing center for both Springfield and Worcester, as well as for the smaller communities near those two cities, it might be assumed that difficulty would be experienced in finding return shipments for the empty containers, after they have carried loads from Boston to the outlying

practically nothing to its present status, where it virtually is equal to that in the westbound direction.

At times the Freight Container Company has been hard put to it to provide enough containers to care for a sudden increase in haulage requirements. Shipments



Containers Are Brought to the Freight Sheds on Trucks of the Freight Container Company



The Containers Are Run Directly Onto Rails on the Top of the Flat Car, Where They Are Securely Locked Into Place

points. The railways state, however, that a practical balance is being maintained in both directions. During the first few weeks of the newly inaugurated service there was about a 20 per cent return of empties to Boston. A large increase in through shipments in an eastward direction soon developed as a result of the intensive campaign carried on by agents of both the railways and the Freight Container Company. At the present time about 60 per cent of the entire tonnage is carried through between Boston and Springfield over the lines of the two electric railways. Overnight service between Boston and either Springfield or Worcester is given.

SHIPPERS INTERESTED IN CONTAINERS

Contributing to the balance of east and west shipments, solicitors have been able to interest a number of regular and heavy shippers in the container idea. Accordingly it has been possible to set up against this kind of steady traffic enough in the opposite direction to balance the exchange of containers. Thus, freight agents have had definite figures in mind, in canvassing their prospects, with respect to the exact amount of traffic needed to maintain this balance. It has been necessary, occasionally, actually to reject shipments in the westward direction in order to cause a topheavy balance of shipments out of Boston. A little less than eight weeks was required to build up the eastbound service from

have been rejected on this ground more than once, but in general the business has grown with a fair degree of steadiness, so that the container company and the railways have been able to predict for future requirements in the matter of equipment prior to the dates on which that equipment was needed. Care has been taken to keep the containers moving as rapidly as possible, so that none will become inadvertently sidetracked at either end of the line.

The direct result of the use of the containers for electric freight service is striking. More than 100 shippers have specified a preference for this method of transporting commodities. During the first month, July, container shipments between Boston and Worcester, both ways, reached 1,200,000 tons; during the next month the total recorded was 1,500,000, and in September the month's total was approximately 4,000,000 tons.

Such encouraging results present a strong argument for freight containers. In addition, the advantage in their use is further attested by a résumé of the type of commodities shipped, as well as the standing of the shippers. For example, each week one chain store company ships 250 tons in containers packed, sealed and delivered to the terminal; also, one paper manufacturing company ships weekly from Holyoke to Boston 200 tons of paper, largely envelopes and gummed wrappers. Others shipping in small lots, classed as l.c.l., according to standard freight classification, and who would not benefit from door-to-door practice under ordinary railway service are manufacturers of various kinds of perishable or easily contaminated products, among which may be noted soap, candy, groceries, gummed materials, paints, knit goods, coffee, tea, metal products sensitive to corrosion and supplies for 5 and 10-cent chain stores.

Since freight containers have been introduced not only do they offer to shippers an improved means

for handling products as compared with bulk shipments loaded loose in standard freight cars, but also from the standpoint of the carrier as they eliminate terminal charges and give a number of incidental advantages.

Short hauls make a profit only on full carloads, based on transportation costs; terminal charges, if included, nullify any profit and damage claims further reduce the favorable margin. By the use of containers, the carrier becomes solely a transportation agent whose business it is to carry freight and, in the majority of cases, not to handle it. In this practice the shipper assumes the responsibility of cartage and delivery as well as packing and hands over the containers, sealed, to the freight agent at the terminal, who merely places the boxes on the cars. This practice is a solution of the problem of haulage overhead.

HANDLING DETAILS SIMPLIFIED

The time required to load a standard freight car is estimated at from 1½ to two hours; the time required for sorting and trucking in terminals is equally as much. Compared with these items, the container loading charge is practically nil for the carrier, as it requires in all, for booking, placing and loading, not more than fifteen minutes per car. In addition, all tracer and claim costs are eliminated, according to the officials of the Boston & Worcester company. The freight agent's duty is, in consequence, a simple matter of routing containers instead of, as is true under ordinary freight practice, routing numerous assorted commodities. For this work a multiform shipping leaflet is used which is quite adequate for the purpose.

The rates quoted for container shipments are: Boston to Worcester, a distance of approximately 45 miles, 25 cents per hundredweight; Boston to Springfield, approximately 100 miles, 35 to 40 cents per hundredweight. With practically all non-transit charges cut down to a low figure, direct electric freight service offers, from these companies' experience, an encouraging prospect. It is further enhanced by a decided increase in inquiries for the container service on the part of shippers.

Record of Five Years of Enterprise in Toronto

FIVE years ago the city of Toronto, Ont., took over the local railway lines. As September marked the birthday month of the activities of the Toronto Transportation Commission, that body deemed it fitting to review the major accomplishments during the last five years. This it did in the *Coupler* for September. Here is the summary:

Cars—Purchased 575 modern steel cars necessary to replace 482 of the 830 Toronto Railway cars which had many years ago become obsolete, many of which were originally horse cars.

Entirely rebuilt the remaining 348 Toronto Railway cars to modern types, such as the one-man treadle cars and six-motor two-car trains.

The total number of cars for service is approximately 1,000.

Trackwork—Extended the trackage of the former systems to the extent of 44 miles. Entirely rebuilt 54 miles of track which was quite unfit from the standpoint of safety and efficiency for street car operation.

Partially rehabilitated 55 miles of track which had sufficient useful life remaining in it to justify the expenditure, yet which was in a very much run-down condition. The commission now operates 244 miles of track.

Coaches and Buses—Inaugurated motor transportation as feeders for street cars; special fare Hill route, racetrack, exhibition, Sunnyside Beach service, sightseeing, chartered work, etc.

The commission has 75 vehicles for use on this work.

Buildings—Purchased old Board of Trade building and completely rebuilt this to serve as a head office building.

Rebuilt and enlarged four of the existing carhouses and constructed a new one.

Built new repair shops, the best street railway shops on the continent, by which savings are effected in reduced cost of rolling stock maintenance sufficient to meet all carrying charges and to pay for the cost of the buildings well within their lifetime.

Public Relations—Lastly, but by no means least in importance, the commission has reasons to feel confident that through the willing co-operative spirit of the men, and by means of the fair, impartial and unbiased policy of those to whom the matters of transportation have been intrusted, the confidence and support of Toronto's citizens has been finally regained.



Five Containers in All May Be Loaded on Each Flat Car, Thus Giving the Railway the Benefit of Full Car Load Haulage



Measuring One of the Main Surface Survey Lines, from Which the Center Lines of the Tunnels Were Calculated. Metal Plugs Were Fixed in the Pavement to Mark the Ends of the Survey Lines. This Work Was Carried Out at Night

London Subway Extended by Tunneling

Five-Mile Addition to Underground System Built in Ten Sections—Accurate Surveys Required to Insure Proper Alignment—In Hard Ground Shields Were Driven Forward by Hydraulic Rams, While in Soft Ground Rotary Excavators Were Used

CONSTRUCTION of the extension of the London Underground from Clapham to Morden, which was begun in 1923, was completed during the present year. Practically all of the new line is tube construction. In hard ground the tunnel was advanced by means of the Greathead shield, while in softer ground a rotary excavator was used. Methods adopted for the layout and execution of this work are typical of the latest British practice, and differ in many respects from those usually followed in this country. The story of the work as told by the London Underground is therefore of particular interest.

From Clapham to Morden is a distance of 5 miles. Except for the last half mile, where the extension runs in the open, the line is of standard tube design, with tunnels of 11 ft. 8½ in. diameter, located at an average depth of 40 ft. below the surface. Between the stations the tunnels are an average distance of 5 ft. apart. At the stations, where the tunnels are of 21 ft. 2½ in. diameter and the lower portion of an escalator shaft comes between them, they are considerably farther apart.

On leaving a station each tunnel has a declivity of 1 in 30 for about 300 ft., while on approaching a station it has a rise of 1 in 60 for about 600 ft. Thus the tunnels are at the same level for a considerable distance between the stations, but they rise and fall at different angles in the sections immediately adjoining them. This switchback principle, applied wherever practicable, promotes acceleration of the trains as they depart from the stations and retards speed as they approach stations, making for economy and energy

consumption and reducing wear and tear on the brakes. Preliminary to construction a route survey was made. First, the course to be followed was laid down approximately on large-scale maps. A detailed survey of the route was then carried out. The chief consideration was to select an easy route, making the curves as flat as possible, and to insure that the tunnels would not encroach on private property except where this was unavoidable. The levels of the highway were taken and all available data collected with respect to underground works, sewers, gas and water mains, etc.

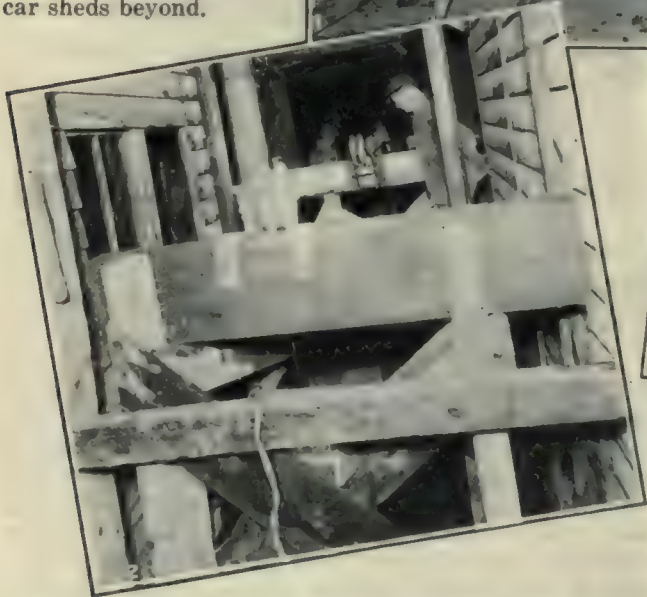
Except for one short stretch, it was found practicable to lay out curves of such long radius that the tunnels could be of the standard 11 ft. 8½ in. diameter throughout. At one point, however, the northbound tunnel had to be made of 12 ft. diameter. In general the curves of the Underground tunnels previously built are of larger diameter than are the tangents.

Arbitrary lines from which the center lines of the tunnels could be calculated were laid out on the street. This process is shown in an accompanying illustration. All places where the tunnels approached close to the building line were carefully checked with a theodolite, to make sure that there would be no encroachment on private property.

TEN SECTIONS IN 5 MILES

Having arrived at a satisfactory layout, the next step was to decide the general scheme of construction. Boring the tube from one point only would have been an extremely protracted undertaking. It is estimated that under such circumstances the Morden extension

would have taken about fifteen years to complete. Work was arranged, therefore, in ten sections, five of which represent the distances between stations and another the section from the last station to the point where the line rises to the surface. Two of the sections between stations were subdivided to facilitate operations where the work had to be carried out under compressed air, the ground being water-logged. In addition, there were concrete tunnels 550 yd. in length, built by the cut and cover process, where the line rose to the surface, and also an above-ground section linking the Morden station with the car sheds beyond.



Transferring the Center Line Below Ground

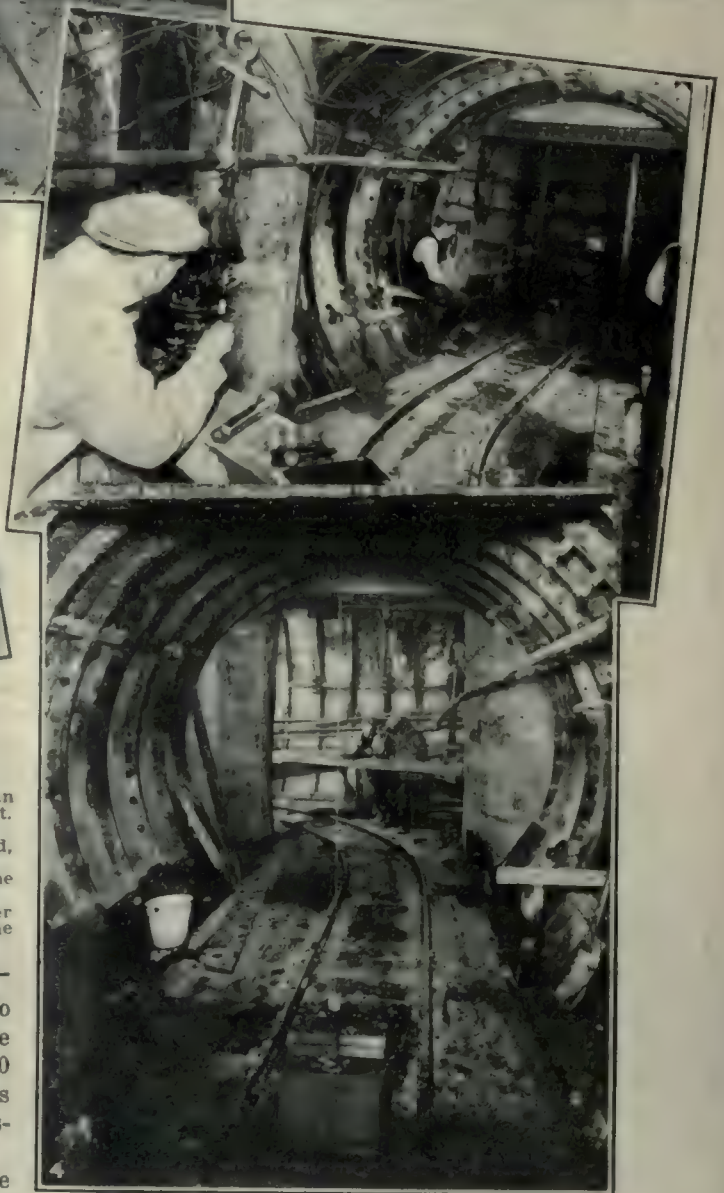
- No. 1. Engineer getting the plumb lines in the service shaft in line with the point over which his theodolite was set in the street. The man in the shaft is adjusting the near wire.
 No. 2. In the service shaft, showing the two plumb lines and, in background in the street, the engineer with his theodolite.
 No. 3. Engineer in the heading getting his theodolite in line with the two plumb lines at the base of the shaft.
 No. 4. At the base of the service shaft, showing the nearer plumb line, with weight in tank of water, and, in distance, the engineer in the heading.

Certain sections of tunnel were bored from south to north, but the majority from north to south. The average length of the longer sections was about 3,000 ft. Intervening among these sections six stations had to be constructed, each with escalator shafts, passageways, etc.

The next step in the work was the sinking of service shafts at the various sites from which tunneling was to proceed. In all, eighteen shafts were sunk. While in the construction of the older tube railways of London these shafts were from 16 ft. to 30 ft. in diameter, on the Morden extension they were only 10 ft. 6 in. in diameter. In previous construction it was customary to install elevators and emergency staircases for the stations in the shafts after the completion of tunneling.

On the Morden line, however, the stations have escalators and the temporary shafts were made of small diameter for reasons of economy.

A shaft having been sunk to the requisite depth, a temporary heading was driven out from it by hand under, and at right angles to, the roadway to the site of the running tunnel. A theodolite was then set up on the surface on the center line of the tunnel as defined on the street, and a point ranged in line opposite the center of the shaft. The instrument was placed over this point and a right angle from the tunnel line was turned off. A steel piano wire was then suspended from the far side of the shaft, being kept taut by a 28-lb. weight immersed in a tank of water,



great care being taken to insure that the wire hung perfectly clear. This wire was then adjusted across the field of view until it exactly bisected the cross-hairs of the telescope. A similar wire, hung from an adjusting screw, was suspended from the near side of the shaft, the two wires being as far apart as the shaft would allow. By means of the adjusting screw the second



Checking Horizontal Location of the Shield by Means of the Plumb Lines



Checking the Level of the Shield by Sighting Over Suspended T Rods

wire was then traversed across the field of view until it coincided with the first wire. The two wires were thus on a true line at right angles to the center line of the tunnel. The distance from the instrument to the nearest wire was next measured.

To transfer the center line to the heading, the theodolite was set up in the heading at the same distance from the near wire as was the case on the surface. The wires were again sighted and the instrument moved on its sliding plates until the two wires appeared as one. When this had been done the instrument was plumb under the point at which it had been set on the street above. With this as a base, the center line of the tunnel was determined by turning off a right

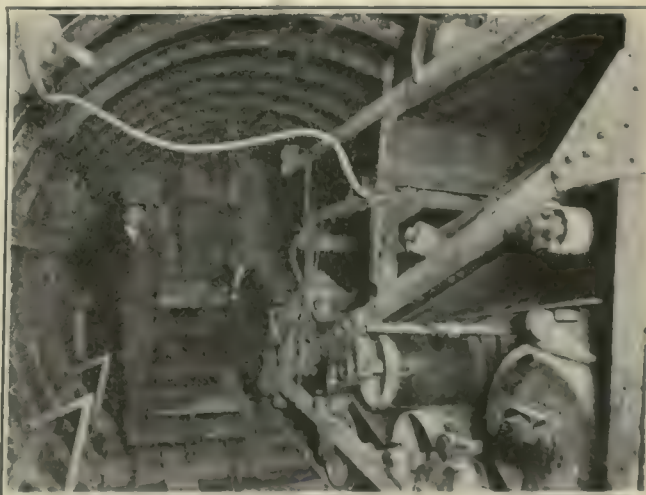
angle. The operation was repeated from time to time as the tunnel increased in length until the engineer was assured that the center line had been established with sufficient accuracy to be used to the end of the drive.

EXCAVATION DONE BY TWO METHODS

The base line below ground having been established, tunneling began. A chamber 15 ft. in diameter was cut at right angles to the heading. The shield was then built up into the chamber, and the correctness of its position and direction having been verified by repeated checkings with the base line data, the task of excavating the tube began in earnest.



Digging the Tunnel by Means of the Greathead Shield. This View Shows the Work South of Camden Town



Rotary Excavator in Use When the Tube Was Pushed Through Soft Material

The shield was driven forward by means of hydraulic rams around the periphery, pressing against the iron lining segments of the tunnel already constructed. By regulating the force exerted by the various rams, a straight tunnel, a curving tunnel, a downward slope or an upward slope were made as occasion demanded. An exigency that had to be taken constantly into consideration was that owing to the weight of the shield there was a tendency for the nose to go downward when uniform pressure was exerted by all the rams.

Operations began on one tunnel only, work on the other not being undertaken until the first tunnel had been driven some little distance ahead. Two shields, therefore, were never working alongside each other.

The skin was carried forward as the shield went ahead and the space that it occupied was then grouted through holes in the lining segments. At the end of a drive, when the shield could be projected no farther, the skin was necessarily left in place between the segments and the earth.

Each cast-iron ring with which the tunnel is lined consists of six segments and a key piece, the latter being inserted in the top of the ring. Where the diameter of the tunnel is increased to 21 ft. 2½ in. at the station platform, twelve segments and a key piece are used. The segments were placed in position and bolted together at the flanges after each advance of the shield, the forward movement being 1 ft. 8 in. for the standard tunnel and 1 ft. 6 in. for the large diameter tubes.

Two types of shields were used, the Greathead and the rotary excavator. In the case of the Greathead shield, men work inside the shield and dig out the earth at the face, as it is broken down by the forward movement. This method was used where the ground was firm. With the rotary excavator the digging is performed by rotating cutters and the earth is thrown back mechanically. The rotary excavator was used only for tunneling through clay when expeditious work was necessary.

STRATA CAREFULLY INVESTIGATED

Trial bores were made of the ground through which the tunnel was to be driven. While such borings afforded a general idea of the nature of the strata in which operations were to proceed, they did not, of course, indicate every peculiarity of the lower levels throughout the course of the line. Borings were made from the surface and also horizontally ahead of the shields. This was done with a long-handled carpenter's augur with sufficient length to penetrate for several feet through the earth to be excavated. When work was proceeding under normal conditions, this was done as a precaution against suddenly encountering water-bearing or other bad ground. When operations were being carried out in compressed air, it was necessary also as a precaution against running unexpectedly into some outlet for the air. The wisdom of these precautionary measures was demonstrated several times during the course of the construction.

In water-logged ground below the surface compressed air was used. An airtight compartment was built in the tunnel between the shaft and the tunnel face. In some cases it was a section of the tunnel itself, from 10 ft. to 20 ft. or more in length, closed by stout bulkhead walls of brick or concrete, each wall having an airtight steel door for the passage of men and materials. In other cases the air lock was a horizontal steel cylinder with a bulkhead wall and steel door at each

end. Sometimes the pressure used was as low as 5 lb. per square inch. In exceptional cases it was as high as 25 lb., or even higher. The average was approximately 10 lb. per square inch. When work was proceeding under a river the pressure had to be adjusted in conformity with the ebb and flow of the tide, which caused a fluctuation in the weight on the clay above the tunnel.

DIRECTION AND LEVEL CHECKED FREQUENTLY

During the process of tunneling, checks on the position of the shield and the direction of drive were taken periodically. As the tunnel was bored iron dogs were fixed in the roof about 35 ft. apart. From them plumb lines were suspended. These dogs were set by an engineer and the plumb lines were placed in exact line with the theodolite. When necessary to check the position of a shield, a bar called a fiddle was placed across the horizontal diameter of the shield. The top of the fiddle was at axis level and had a notch in the middle denoting the center of the shield. A small piece of wood having a slit illuminated by a candle was then placed on the fiddle and shifted back and forth until the slit coincided with the plumb lines. It was then noted how much the notch on the fiddle was to the right or left of the center line of the tunnel and the error in position determined.

For testing the level of the shield, hangers were bolted to the roof of the tunnel on which adjustable pins had been set by the engineer to an exact level. From these pins T-shaped rods were suspended, the crosshead representing the true axis level of the tunnel. The piece of wood was then placed against the face of the fiddle with the slit horizontal and raised or lowered until it coincided with the line of sight of the crossheads. The position of the top of the fiddle was then noted in relation to the slit and any necessary adjustment of the shield was made by variation in the force exerted by the rams.

For further guidance, square lines were set out at right angles to the center line of the tunnel, and trailing rods divided into feet and inches were attached to each side of the shield. If the shield was proceeding square with the center line, readings were equal on the scales of the trailing rods. When the readings were unequal it indicated that the shield would soon be out of line.

For boring curves the engineer furnished the foreman with a list showing for every foot the shield advanced how much to the right or left of the center line it should be. When sighting on the fiddle the foreman could therefore ascertain his position by referring to the list. Trailing rods with different scales were provided for curves. While the rod for the inside of the curve was divided into feet and inches, on the outer rod the divisions, although marked as feet and inches, were "stretched" to correspond with the lengths on the inside. Vertical lines also were established by the engineer and it was thus possible to ascertain from the readings on the trailing rods whether or not the nose of the shield was being kept to the correct line of the curve. The maximum deviation from level or center allowed in a shield was 1½ in.

When the construction of the Morden extension was at its height, eighteen shields were in operation simultaneously on various parts of the line. Twelve were at work on the running tunnels and six of extra large size on the platform tunnels of the stations.



Large Crowds Were Interested in the Exhibit of the New York State Railways at the Rochester Industrial Exposition

Seeing What the Motorman Sees

Motion Picture Displayed by the New York State Railways at the Rochester Industrial Exposition Attracted Large Crowds—Taken from the Front Vestibule of a Moving Car, It Showed the Many Hazards of Operation Through Congested Streets

By L. R. Brown

New York State Railways, Rochester, N. Y.

FOR the first time in several years the New York State Railways was represented this year at the Rochester Industrial Exposition. The company rented three adjoining booths on the center isle in the building housing the industrial exhibits and combined them. The space was arranged as a miniature motion picture theater resembling the interior of a street car. The front vestibule of a car was built to actual size fac-

ing one of the aisles. Behind this were seats arranged in the same way as in a street car. At the back was a booth housing motion picture and lantern slide machines. The screen was inside the front vestibule in the position of the motorman's window and the surrounding woodwork painted black.

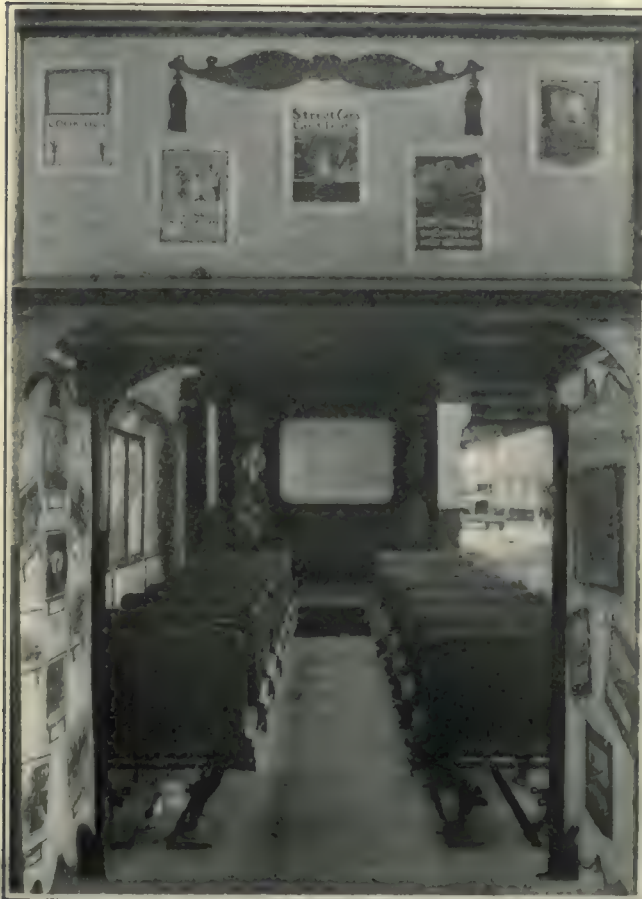
The back wall of the booth was arranged to represent the side windows of a street car, except that, in place of



Posters Took the Place of Glass in the Side Windows

glass, posters were displayed telling the value of street car service to the community. Posters carrying facts about the street railway in Rochester were placed in the space above the windows ordinarily used for advertising merchandise. The walls supporting the projection room were used to advertise the electric railway industry.

These street car seats accommodated 32 people and



The Railway Booth Was Arranged to Resemble a Car Interior

afforded about the only opportunity inside the exposition buildings for people to sit down and rest. On one of the front windows of the car and on one of the panels in the rear were painted these words, "Rest Here and Enjoy Street Car Comfort."

"What the Motorman Sees" was one of the principal motion pictures shown to the audience. It was taken in Rochester by a local motion picture man, under the supervision of the safety director, from the front vestibule of a street car. When looking at this picture displayed on the screen one got the effect of riding in a street car and seeing what the motorman sees.

Five different incidents were displayed. One was an automobile "cutting in" in front of a street car without warning. Another was a street car being delayed by a slow-moving vehicle refusing to turn out and give the right of way. The third consisted of boys playing in the streets. One of them darted suddenly out in front of an oncoming car to retrieve a fumbled ball. A fourth scene depicted a boy catching a ride on the rear of a street car and getting a bad fall by jumping off in front of an oncoming car. The fifth showed a man alighting from a street car and walking around the rear onto the other track in front of an oncoming automobile.

In addition, other pictures taken by the railway in Rochester were shown. One was entitled "Traffic Conditions in Rochester" and showed a number of violations

of the law by automobilists which endangered street car traffic. Another was "The Gap in the Line" and showed the efforts of the railway to take care of the service when a blockade occurs. Lantern slides from the National Safety Council were used also to interest the crowds in the dangerous practices in which street car patrons often indulge.

It was necessary at all times to have two or more men present at the exhibit to operate the motion picture and lantern slide machines and keep a continuous attraction before the people. Two motion picture machines of the bulb type and one lantern slide machine were used. At first the pictures did not show up so very well in the daytime as all the artificial lights in the building kept burning and there was considerable reflection on the screen. This was to a great extent overcome by constructing a canopy of black oilcloth to shade the screen.

From the opening of the exhibit at 10 o'clock Monday morning until its closing at 11 o'clock Saturday night the exhibit was an unqualified success in attracting crowds. The seats were filled at nearly all times and many times the people were crowded four and five deep in the standing space outside the booth. Even when no pictures were being shown many people occupied the seats just for the purpose of rest and relaxation. When so doing they, of course, were gazing around and reading the messages painted on the walls for their benefit. The crowd was constantly changing and owing to the



Full-Size Front Vestibule at One End of the Exhibit

booth's prominent location nearly every one who visited the exposition passed the booth and all who passed paused for a moment to read the messages or watch the pictures. Children were especially interested in the exhibit and a parent with a child had difficulty in getting by without stopping to see the pictures. A comedy motion picture was displayed occasionally to attract the crowd and the safety slides and film were shown between the scenes of comedy.

High Current Capacity with Exceptional Flexibility Feature of Catenary

New Overhead of Chicago, South Shore & South Bend Railroad Gives Uniform Load of 0.7 Lb. per Foot on Pantograph—Maximum Life Assured by Use of All Non-Ferrous Materials

By L. W. Birch

Line Material Engineer Ohio Brass Company

"Ideal" Section of Chicago, South Shore & South Bend Railroad, Showing Limited Train in Service



SLIGHTLY more than a year ago the Insull interests purchased the Chicago, Lake Shore & South Bend Railway and, after renaming it the Chicago, South Shore & South Bend Railroad, proceeded to spend an aggregate of \$3,615,000 for new equipment and rehabilitation of the right-of-way. Of this amount, \$1,330,000 was spent for new equipment and \$1,428,000 for the rebuilding of overhead, structures and roadway. In addition, the Northern Indiana Public Service Company has spent \$857,000 for substation equipment and high-tension lines. Twenty-five new steel motor passenger cars and four locomotives have been placed in service. In addition to these, there will be delivered later two dining cars and two parlor-observation cars. The overhead system is being completely rebuilt and a 1,500-volt d.c. system has replaced the old 6,600-volt a.c. system. Eight new substations and interconnecting high-tension lines have been added and many waiting rooms and stations rebuilt. New 100-lb. rail and ballast are replacing the old. In other words, a new railroad has been built on an old right-of-way.

For the past few years it has been recognized that there are two ways to design an overhead system, either of which could be considered as good design, even though it be selected without consideration of current requirements and cost. One method is to build a light overhead collection system with separate feeder for conductivity and the other is to construct an overhead system in which all conductivity is placed in the contact and supporting messenger wires. With the former design the advantage of light-weight overhead is obtained, thus diminishing the size and weight of structures, hardware and fittings. With the latter, owing to larger cables resulting, a system employing long pole spacing, heavier structures and a single insulated set of conductors is possible. By comparing the cost of one system with that of the other for some given railroad it is fairly easy to determine which system is preferable. Considerable economy will show for one of the systems. This method of selecting an overhead system should not be decisive. There are innumerable jokers which may creep in and upset this line of rea-



Curve Construction on Single-Track, Wood-Pole Section of the Railroad



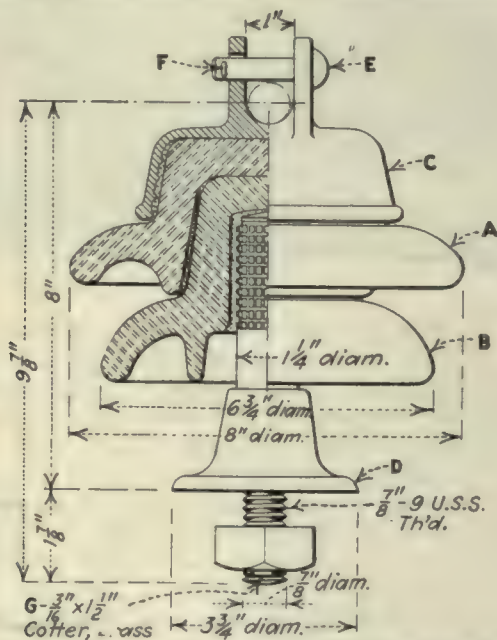
Original Installation of Overhead, Chicago, South Shore & South Bend Railroad, Kensington Division

soning, but in general it will suffice for a beginning.

The problem confronting Charles H. Jones, now general manager of the South Shore Line, was to select an overhead system for 1,500 volts d.c. which would provide sufficient conductivity, was adaptable to the old pole locations, was flexible and at the same time permitted of high-speed operation. It should also be constructed of such materials as to insure maximum life

was accomplished by proportioning the copper between contact wires and messenger wires in the catenary make-up. A skillful division of copper and steel in the main messenger wire made possible the selection of a cable of higher ultimate strength, with less sag to be considered and, as a result, a saving in hanger lengths, particularly on curves.

The original overhead system as built some eighteen years ago consisted of a $\frac{1}{4}$ -in. Siemens-Martin steel cable with a No. 0000 copper intermediate wire and No. 0000 steel contact or slipper wire. Rigid hangers of the "sister hook" type connected the main messenger with the intermediate wire, while the intermediate wire and steel contact wire were connected with cast bronze duplex clips. The latter were spaced equidistant between hangers and provided flexibility as well as a feeder connection. This system operated remarkably well, considering the speeds which were attained at the start of operation. However, as the railroad progressed and every one learned more concerning current collection and the problems of overhead maintenance a great difficulty became apparent. This appeared in the steel contact wire. It was not working out satisfactorily. Motormen complained of rust-stained windows and the shop men of too rapidly wearing contact shoes on the pantographs. The overhead man suddenly noticed an unusual amount of arcing and burning. This condition, however, continued until eliminated by the substitution of copper contact wire during the present rehabilitation. A like substitution was made by a number of Eastern roads about the same time. This combination continued in operation until recently, when it was replaced by the new overhead.



Messenger-Supporting Insulator Used on Ideal Section

under existing smoke and atmospheric conditions and should be cheapest from the standpoint of dollars per ampere-mile. The answer to the problem was a system embodying supporting cable, feeder and contact wires in the same grouping. In brief, the additional copper necessary to provide sufficient feeder capacity for the contact wires was not hung separately from the structures, but became a part of the overhead system. This

NEW OVERHEAD SYSTEM

Owing to the soundness of the wood poles and the added expense of resetting for greater pole spacing, the old poles were considered adequate for most of the new construction. Having been previously reset in concrete, they were sufficiently secure to withstand the loads im-

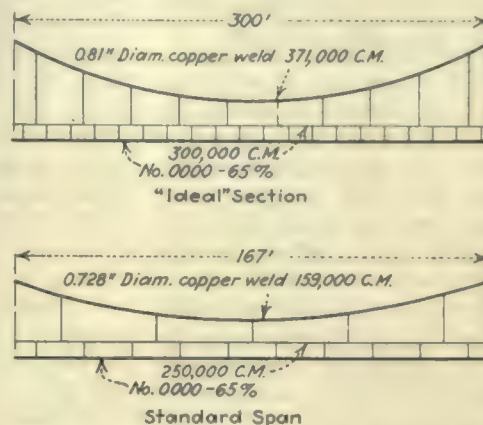
posed by the new catenary. Hence, only a certain amount of straightening was necessary before the pole job was considered complete. Bates steel trusses were attached to these old poles to span the two tracks and support the catenary. Suspension insulators were attached to these trusses by a clamping device which permitted of alignment with track centers after the messenger had been strung. Along the single-track section an adjustable type of galvanized bracket arm was used on each pole.

It is interesting to note that the original bracket arms, which were of T section and plain, were almost entirely eaten away with rust when removed. The new galvanized brackets will not be subject to this condition. The pole spacing on the old work was 167 ft. on tangents, consequently this became the normal span for the new work, with the exception of that portion of the track paralleling the New York Central Railroad, known as the Ideal section. This section has 300-ft. tower spacing and employs built-up galvanized Bates bridges. The general span design, however, is identical with that chosen for the replacement on 167-ft. spans.

In order to incorporate conductivity and strength in the same combination, a span design was selected as shown in the line diagram. The main messenger or supporting catenary wire was connected to the intermediate wire by means of a rigid hanger, while the contact wire was supported from the intermediate wire with a flexible hanger. The rigid hanger provided good electrical conductivity between main messenger and intermediate messenger, while the flexible hanger provided a relief from the "hard spots" during pantograph passage along the wire. Frequent feeder connections or bonds were placed between intermediate wire and contact wire to aid further in increasing the current-carrying characteristics of the line. A similar arrangement for inclined hanger construction was designed for the curve work, the plan of using short flexible hangers being continued through the curve.

In addition to good collection characteristics, this form of catenary gave a very pleasing span as far as appearance was concerned and provided a uniform load of 0.7 lb. per foot on the pantograph.

This particular type of span design, in addition to providing good conductivity and mechanical strength, lends itself admirably to the replacement of the contact wire. With pantograph operation, the new contact wire may be strung while the old one is in service. This may be accomplished by suspending the new wire with the short flexible hangers alongside the old one. The old wire and hangers may then be removed after the new wire is properly sagged. It is even possible by a slight



At Top, Ideal Section Span. Below, Standard Span

change in curve hanger design and a resagging of main messenger wire to add a second contact wire in case load conditions materially increase.

Insulation on the bracket arms was similar to many other existing 1,500-volt d.c. lines. However, the insulation on the steel towers in the Ideal section was of a somewhat new design. This insulator, which has had a long field record, was of the two-piece design and provided a good factor of safety in case of breakage of one part or in case of an extremely high inductive voltage from the adjacent high-tension line. A saddle casting formed the cap and the main messenger rested in this saddle. Messenger anchorages were placed at approximately 1-mile intervals. The arrangement used was that of dead-ending direct to the steel truss of a bridge through high-strength ball-socket insulators.



Illinois Central Right-of-Way Over Which Passengers Are Carried from Kensington to Randolph Street, Chicago

Maintenance Notes

Effective Means of Supporting Armature Coils

WHILE insulating armature coils on taping machines the operator should have coil hangers on both sides. Those on one side support the coils before they are taped and those on the other hold the finished coils. A convenient arrangement of hangers, which can be shoved under the table out of the way when not in use, is incorporated in the equipment of the new electrical repair shop of the Brooklyn-Manhattan Transit Corporation. As shown in the accompanying illustration, the hangers consist of 3-ft. lengths of 1½-in. iron pipe fastened to the underside of the table on each side of the operator. Into each length of the supporting pipe is a piece of ¾-in.

pipe on which the coils are hung. The ends of the small pipe which support the coils are provided with bushings, so that there are no sharp edges, and in order to prevent the pulling out of the pipe entirely the larger pipe is fitted with a bushing which closes in the end opening sufficiently that the bushing on the end of the ¾-in. pipe cannot pass through.

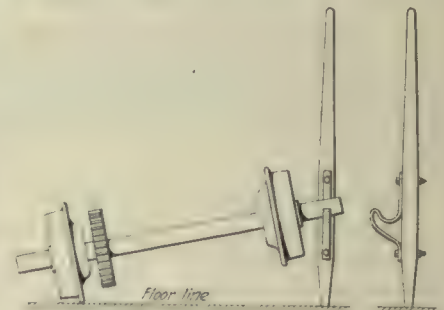
In a shop like this, all of the appointments of which are cement or metal, this construction will harmonize particularly to bring out a pleasing appearance and also provide a most convenient arrangement.

"A.E.R.A."

"A"dvocates "E"xpert, "R"egular "A"ttention—to all details in the upkeep of your equipment.

Handling Wheels by a Wheel Stick

MOVING a pair of wheels from one location to another is very easily accomplished by means of a wheel stick as used by the New York Railways. This stick is made of a piece of 3-in. x 4-in. oak about 4½ ft. long upon which is mounted a bearing made of ¾-in. x 2½-in. flat iron.



Moving Pair of Wheels with Wheel Stick.
At Right, Side View of Wheel Stick

The center of this bearing is located so that when placed under the journal end of the axle it will raise one wheel about ½ in. off the floor, thus permitting the wheels to be swung to any desired angle.

From the bottom of the bearing bracket the stick is tapered down to about 2 in. x 2 in. and from the top of the bracket it is rounded and tapered to permit of a good hand grip.

This stick will prove a very useful tool where a pair of wheels are to be moved about the floor and no immediate lifting facilities are available.

*"All's well that's oiled well"
Is the tale your bearings tell.*

Round Soft Steel for Truck Repairs

FAILURES in truck members are now repaired in the shops of the Portland Railroad, Portland, Me., with round soft steel rod. Diameters of ½ in. or ¾ in. are frequently used for this purpose. The round lengths are electrically welded to the metal of the truck following the welding of



Benches on Which Taping Machines Are Operated in the Shops of the Brooklyn-Manhattan Transit Corporation Have Pipe Supports on Each Side for the Armature Coils That Can be Shoved Underneath When Not in Use



Using Soft Steel in Repairing Truck Failures

the actual section which had failed. Thus the new metal assists in holding the members in position and absorbs much of the shock which would otherwise be transmitted to the repaired part.

Kinks from Decatur, Ill.

Earnest Efforts and Modern Methods Bring Satisfactory Savings on the I.T.S.

CAMPAIGNING in the direction of systematizing and correlating work in the shops of the Illinois Traction System, coupled with effort to select shopmen carefully and provide them with pleasant working conditions, has been bringing results, according to the brief of the company in the 1926 Coffin Award contest. Time-saving devices used in the shop include such innovations as intercommunicating telephone systems and development of special machinery and devices in the air brake, blacksmith, electric and painting departments. In addition to cutting down the time required for the several operations of car maintenance and construction there has been an intensive study of reclamation.

By the use of a mechanical separator in the foundry, bits of iron and steel which are removed from brass borings and which were formerly sold at from 3 to 4 cents a pound are now used over again. The resulting saving amounts per pound to from 4 to 5 cents. Compressor heads which formerly were junked are now repaired at a cost of 40 cents by the use of special tools. This results in a saving of \$14 for each compressor head thus salvaged. Slides for Miller trolley shoes are built up for 43 cents, as compared with the previous cost of \$1.75 for a new slide. Cast steel wheels formerly considered too hard for turning are now turned in the company's shop, and wheels once scrapped for flat spots are now again made available for service.

Car axles which have become worn at the journal are built up by the

welder and used again. Gear cases costing \$48 each and frame heads costing \$50 are saved from the scrap pile by a special method recently developed. Car axles worn to condemning limits but showing no structural flaws are treated and turned down to smaller sizes.

A system of ventilation for the GE-73 motor has been worked out by means of which the capacity of the motor has been increased 66 per cent. The capacity of trolley poles and trolley bases has been increased by running heavy cable in shunt with these parts.

Pull rods and equalizer bars are now made from one piece of metal. No welding is permitted in these pieces and the breakage of these parts has been practically eliminated. Headlight switches have been given a uniform location and so placed that

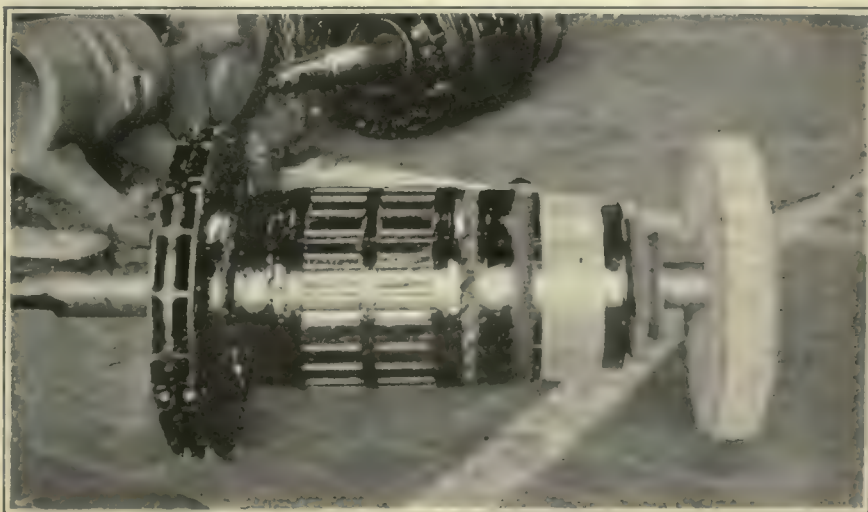
the motorman need not take his eyes off the right-of-way to operate the switch. Large lights of opalescent glass in the top outside sash have been split and a metal mullion has been inserted. This has meant that the number of lights of this kind which have been broken has been greatly reduced.

The composite result of this campaign is shown by the following comparison: During the twelve months ended April 30, 1926, there was a total of only 391 car failures on the main division for 6,148,240 car-miles, or an average of one car failure for 15,720 car-miles. This compares with an average of one failure for 13,016 car-miles for the previous three years, and of one car failure for 8,804 car-miles for 1920—five years ago. Incidentally, during the past eighteen months all of the regularly operated passenger equipment and 800 of the freight cars have been put through the paint shop.

End Block Used to Protect Armatures from Injury

ARMATURES with a construction as used with the GE-264 or Westinghouse 508 motors have a ventilating fan at the end. As this housing is of considerably larger diameter than the armature core there is danger of damaging the commutator or small end in handling.

In order to keep the small end of such armatures off the floor, Ernest Lunda, master mechanic of the Grand Rapids Railway, fits these types of armatures with a circular wooden block. The diameter of this block is 1 in. less than that of the ventilated end housing, so that in



Keeping the Small End of Armatures Off the Floor by Use of a Wooden Block Support

rolling the shaft has a tendency to work into the block rather than out of it. The blocks are 2 in. thick.

New Equipment Available

Dust Kept from Carbon Brushes of Railway Motors

WHEN self-ventilation was incorporated in railway motor design some years ago it resulted in a somewhat shorter life of the brushes, brush-holders and commutators than in the totally inclosed types, due to additional wear caused by dirt. Although this condition was considered undesirable, it was accepted by railway operators because of the advantages of reduced weight per horsepower and the increased ratings possible with a ventilated motor of specified dimensions.

Several improvements have been devised by engineers of the Westinghouse Electric & Manufacturing Company in order to overcome the disadvantages. The closed front brush-holder and, later, the dust cap holder, which totally inclosed the carbon except the contact surface, were brought out. Further study and experimentation have resulted in the conception of a dual ventilation scheme. An experimental type motor, No. 508, with dual ventilation, was placed in service, and as a result of the satisfactory operation this dual ventilation will soon become a feature of all standard motors of 25 and 35 hp. rating.

Dual ventilation is obtained by having a baffle inside the frame which separates the commutating mechanism from the coils in the main portion of the frame. The air is taken in through two inlets, one in the commutator housing, the other in the main frame casting. The external appearance of the motor is practically unchanged from that of the ordinary self-ventilated type. Dimensions pertaining to the installation of the motor on car trucks are unchanged. The armatures of dual ventilated motors are interchangeable with those in the other motors as before. No special armature coils are required.

Records of brush mileage and measurements of commutator wear in the motor under test indicate that the life of these parts as affected by

wear due to dirt is four times the life of similar parts in the ordinary self-ventilated motor of the same type.

Ticket Printing and Registering Machine

FROM 1 cent up to \$99.99 any amount may be registered by the No. 79 Ohmer ticket printing and auditing machine which has recently been announced by the Ohmer Fare Register Company of Dayton, Ohio. A ticket is printed and issued for the amount desired and at the same time a duplicate record of the data which are printed on the ticket is also printed on the day's report within the machine. The machine

and being taken up as the passenger leaves the car, while the second ticket, marked R.T., is given to the passenger for collection by the return operator.

When taking his car or bus the operator must place his identification key in the machine before he can operate it. This prints his number on the daily report opposite the record of each ticket issued. Pulling out this key locks the machine. The operator issues the first ticket to himself with fare designation in blank and holds this ticket. All tickets are lifted as passengers leave the car or bus and are turned in to the office with the day's collection, which should balance with them. An inspector entering the car may examine any ticket to see whether the



Each Ticket Issued by the Conductor Bears Complete Data Printed on Its Face While the Same Information Is Listed on the Day's Record Inside the Machine

may be mounted upon a bracket or may be carried by the operator by means of a belt and shoulder support. It weighs but 10 lb. and measures 6½ in. x 6½ in. x 8 in. high.

An earlier form of this machine was illustrated in this paper for Dec. 19, 1925, page 1079.

The machine was designed to give complete protection against manipulation and the usual losses due to carelessness and dishonesty. Ticket fares, transfers, interline tickets, mileage and all paper fare mediums receive the same protection as do cash fares. It is also possible to issue round-trip tickets with the machine, one ticket being issued to the passenger for the immediate ride

consecutive number is higher than that issued by the conductor to himself, thus determining whether the ticket is one that has been picked up from the floor or one that has been held out from a previous settlement with the office.

The No. 79 Ohmer ticket printing and auditing machine is made in four types as follows:

79-O—To record up to nine zones and with a maximum cash capacity of 99 cents.

79-A—To record up to 99 zones and \$9.99.

79-B—To record up to 999 zones and \$9.99.

79-C—To record up to 999 zones and \$99.99.

Association News & Discussions

Iowa Railway Operators Convene

Interspersed with Shop Talks and More General Subjects Was the Annual Convention of the Operators' Section—Talks on Grand Rapids and an Actual Demonstration of Motor Bus Oil Dilution Were Features

WELL thought out papers and addresses followed by a lively discussion constituted the serious side of the two-day convention at Omaha of the Operators' Section of the Iowa Electric Railway Association held Nov. 17 and 18. The banquet on the evening of the first day was both of a serious and entertaining nature. Thorne Brown delivered an address that depicted the railway situation viewed from his recent years as railway commissioner of Nebraska. The entertainment following the address was produced by songs and other music by some of the talent known to the radio world through stations WOAW, Omaha, and WOC, Davenport.

The entire program was well up to the standard expected by Chairman John Sutherland. After "good" Mayor James Dahlman presented an address of welcome at the opening session, the meetings were turned over to regular business.

L. J. DeLamarter, president and general manager Grand Rapids Railway, Grand Rapids, Mich., prepared a paper which was read by J. W. Knecht, general superintendent of the same company. In this paper were set forth some of the facts of the recent Grand Rapids success with new cars. An abstract will appear in a future issue. Mr. Knecht added much information to show that increased revenue as well as reduced expenses have followed the steps of progress taken by the Grand Rapids company in recent years. On lines equipped with the 27 new cars recently purchased an increase in gross revenue of 2.93 per cent has been experienced as against a decrease of 1.22 per cent for the same period on lines having old cars. Total operating expenses for the property month by month since the new cars started have been reduced this year from last as shown in the table on page 972. The results were analyzed to show that these reductions were obtained in maintenance, power, and other departments as well. Old cars average about 3.22 kw.-hr. as against 2.10 kw.-hr. per car-mile for the new cars. The first three sample cars weighed about 25,000 lb. each. The new lot of 27 weigh 29,500 lb. apiece.

In discussion Mr. Knecht spoke of the continued advertising done in papers, talks, special stunts and the company paper, *Trolley Topics*.

P. G. Swars, Westinghouse Electric & Manufacturing Company, in discussion stated that marked improvement could be made on many systems by

closer attention to maintenance. In particular the noise arising from the overhead trolley could be reduced to the great advantage of the car operation. C. M. Feist, master mechanic Sioux City Service Company, told of a shock absorber that he had built for one of the Sioux City cars that has greatly improved its riding qualities.

Leonard C. Donohoe, chief clerk motor carrier department, Board of Railroad Commissioners of Iowa, in a paper on the regulation and development of motor carriers in Iowa, gave much data which present an excellent picture of the bus situation in Iowa from the standpoint of the railway commission.

The first Iowa motor carrier law was enacted by the 40th General Assembly and became effective on July 4, 1923. It lived less than two years, but during that time several changes were made that formed the background for the present law. This latter was passed by the 41st General Assembly and became effective on April 17, 1925, and is still in effect. It provides for the assessing of taxes and penalties against motor carriers and for the collection and distribution of them. The tax provided is 0.25 cent per ton-mile for vehicles equipped with pneumatic tires and 0.50 cent per ton-mile for motor vehicles equipped with solid tires. Although the rate of taxation as provided by the present law is twice the rate provided by the old law, the present law requires motor carriers to pay the tax only on the actual operations, whereas the old law, in providing the manner of assessing the tax against passenger motor carriers, provided that "In no event, however, shall the number of miles operated be considered as less than the number of miles required to be operated to maintain its filed schedules."

Twenty per cent of all moneys collected is for the use of the board in administering and enforcing the provisions of the law and the regulation of motor carriers, and 80 per cent of such moneys is allocated each month to the various counties in the proportion that the number of ton-miles of travel in the respective counties bears to the total number of ton-miles of travel within the state. The money allocated to the counties is for the use of the county boards of supervisors in maintaining and repairing the highways used by motor carriers.

The board is given power to fix or approve rates, fares, charges, classifications, and regulations pertaining thereto; to regulate and supervise the accounts, schedules, service and safety

of operations of each motor carrier; to prescribe a uniform system and classification of accounts; to require the filing of annual and other reports, and to supervise and regulate motor carriers in all other matters affecting the relationship between such carriers and the traveling and shipping public.

It is also declared unlawful for any motor carrier to operate without first having obtained a certificate of convenience and necessity. Before such a certificate can be issued, the board is required to hold a public hearing and make a finding that the service proposed will promote the public convenience and necessity.

What the railway industry is doing to meet changed conditions was the subject discussed in a paper by E. W. Miller, general superintendent Des Moines City Railway. The several subjects discussed by Mr. Miller will be abstracted in a future issue. It was brought out that there had been a special wheel designed in Des Moines that would chip or scoop ice and snow that had become packed in the rail slots.

STANDARD FOR PULL-INS NEEDED

All through the meetings the question of pull-in records were discussed. The figures offered by different properties varied over a very wide range from 4,000-5,000 car-miles per pull-in up to 20,000 car-miles per pull-in reported by Des Moines. It was pointed out that no standard for pull-ins had ever been determined and hence relative figures meant nothing. Reference was made to figures reported this spring as high as 98,000 car-miles per pull-in for a Southern property.

Much valuable information pertaining to motor bus lubrication was given in a talk by Major Parker of the Standard Oil Company, who differentiated between "road" and "shop" troubles of lubrication. Most road troubles arise from excessive oil consumption, generally resulting in dilution of the crankcase oil.

Thinning out of oil becomes more noticeable with distance traveled and generally increases with improper combustion of the gasoline used; too rich a mixture, often caused by excessive use of choke; operation at too cool a temperature; and poor fuel having too large a component that will not vaporize below 450 deg. F. Engines operate most efficiently at about 180 deg. temperature of cooling water and should never be allowed to drop below 130 deg. Less dilution will result in operation at temperatures near 180 deg. than at lower points.

Major Parker demonstrated the Sleigh dilution testing method. From a 100-c.c. sample of oil removed from a motor truck after 800 miles of running about 15 c.c. of gasoline was removed, after heating and condensing the gas boiled off. Then by mixing

some Fuller's earth with the remaining oil the mass was filtered and clear oil was recovered.

ELECTRIC RAILWAYS FROM THE ECONOMIC STANDPOINT

Thorne Brown faced frankly the electric railway situation as he sees it in relation to other utilities. For years he has been on the Nebraska State Railway Commission and for a considerable part of this time its chairman. At present Mr. Brown is industrial commissioner of the Omaha Chamber of Commerce.

The telephone industry, according to Mr. Brown, is the only natural monopoly, as every user adds to the potential service possible to every other user. The telephone service does not begin to cost what it is worth. Likewise the gas rates of \$1.10 to \$1.25 per thousand cubic feet are not up to what the traffic will bear. The electric light and power companies have always had potential competition in the formation of public or municipally-owned systems, and fortunately because of the growth of this industry it has been possible to offset the dwindling purchasing power of a dollar.

Electric railways, however, are facing the ever-increasing use of private transportation and are, according to the speaker, a semi-decadent and semi-obsolete business. With the exchequer constantly decreasing it becomes economically impossible to increase fares to offset the declining net revenues. The reason for this seems beyond the control of operators since they cannot cut overhead to a great extent and likewise cannot reduce the service.

While the parking problem and street congestion in cities of 500,000 population and over seem to have checked the dwindling revenues to some extent, this is not true of smaller communities. The picking up habit of many drivers in small cities is not a hostile act against the railways.

Mr. Brown stated that the transportation system of cities was necessary and that in his opinion buses were not the answer. The facts boiled down to the statement that the railways had not successfully sold their service. They have not reached rates as yet to equal the value of the service, but an economic limit apparently exists beyond which increased rates will not produce proportionate increased revenue.

City fathers have generally failed to grasp the situation and still insist on unreasonable taxes and burdens for no reason except that they once existed.

Reluctantly Mr. Brown advanced a theory that public ownership was the solution, not because he favors government operation, but only through that channel can municipal authorities be brought to realize the problems of the transportation companies. He states frankly that poorer service will ensue, less courtesy will be shown under municipal operation; but this is the price that the public will have to pay for the apparent inability to create conditions of fairness and common sense that will permit private capital to continue to finance and operate city transportation.

At the outset Mr. Brown said he would not give a frivolous address, since he saw no frivolity in the busi-

COMING MEETINGS

OF

Electric Railway and Allied Associations

Dec. 2-3—Highway Research Board—Division Engineering and Industrial Research, annual meeting. National Academy of Sciences—National Research Council Building, Washington, D. C.

Dec. 3—American Electric Railway Association, Metropolitan Section, Engineering Societies Building, New York City, 8 p.m.

Dec. 6-9—American Society of Mechanical Engineers, annual meeting, New York City, Engineering Societies Building.

Jan. 6-7—Midwest Electric Railway Association, midwinter meeting, Mayo Hotel, Tulsa, Okla.

Jan. 10-14—American Road Builders' Association, convention and road show, Coliseum, Chicago, Ill.

Jan. 25—New York Electric Railway Association, winter meeting, Hotel Commodore, New York City.

Jan. 26-28—Association of Equipment Men—Southern Properties—Memphis, Tenn.

Feb. 3-4—Central Electric Railway Association, winter meeting, Toledo, O., Commodore Perry Hotel.

ness. It takes courage to operate a railway today. A railway operator is like a farmer in many respects, but even the farmer has the sympathy of the people.

STOREKEEPER PLAYS IMPORTANT PART

Frank McDonald, superintendent of purchases Waterloo, Cedar Falls & Northern Railway, gave an excellent analysis of the good that can arise from proper co-operation between department heads and the purchasing agent. Extensive work planned by the company should be brought to the purchasing agent's attention so that he may have adequate time to locate proper materials and wisely to plan their purchase. The purchasing agent who buys on price without regard to quality or the use to which the materials will be put does an injustice to his company and the manufacturer as well.

When materials require extensive labor in their installation it oftentimes proves more economical to use a high grade of material when longer life can be obtained.

According to John Duncan, master mechanic of the Fort Dodge, Des Moines & Southern Railroad, his is one of three roads in Iowa to be living up to the rules of the bureau of locomotive

inspection. The bureau requires very rigid inspection of air-brake equipment.

Frosting of windows in the locomotive cabs has been troublesome in winter. This difficulty has been corrected by allowing air to blow against the inside of the window through a small 1/64 in. opening. This small current of air prevents frost forming and likewise sleet or snow and is even successful in breaking up large drops of rain so that a clear vision is obtained.

William G. Brooks, Westinghouse Electric & Manufacturing Company, decried the practice of manufacturing carried on in many repair shops. He advised the use of labor-saving tools and equipment such as bearing presses, car-body jacks and chucks designed for centering bearings. Mr. Brooks called attention to the fact that maintaining is 30 per cent material and 70 per cent labor and that it made for far greater success to perform more work in the maintenance shop than to wait until the equipment broke down and went to the repair shop. He commented favorably on the maintenance methods of the Omaha & Council Bluffs Street Railway and stated that it was maintaining cars for 2.23 cents, whereas the average for twenty roads of similar size has been reported as 3.78 cents per car-mile.

Unfortunately Henry Cordell, master mechanic Chicago, North Shore & Milwaukee Railroad, because of sickness, was unable to attend the meeting and deliver the paper for which he was scheduled.

The meetings were attended by 101 delegates and several guests. Fifty-three of the delegates were operating men from the Iowa and Nebraska properties and 48 were manufacturers' representatives.

Maurice Welch, superintendent and traffic manager Waterloo, Cedar Falls & Northern Railway, was named chairman of the executive committee, with directors as follows: R. W. Herrick, superintendent Sioux City Service Company; F. S. Welty, assistant general manager Omaha & Council Bluffs Street Railway; E. W. Miller, superintendent of transportation Des Moines City Railway; A. H. Smith, Dubuque Electric Company. Manufacturing representatives on the executive committees are: W. F. Weil, sales representative American Brake Shoe & Foundry Company, Chicago; H. R. Sampson, district sales manager Ohio Brass Company, Chicago; K. A. Hills, manager Davenport office General Electric Company; G. J. Hart, sales engineer Westinghouse Electric & Manufacturing Company, Des Moines.

John Sutherland, master mechanic Tri-City Railway, was re-elected for his fourth term as chairman of the convention.

Midwest Annual Meeting in Tulsa Jan. 6-7

DATES for the midwinter meeting of the Midwest Electric Railway Association have been set for Jan. 6 and 7 by the executive committee. The meeting will be held at the Mayo Hotel, Tulsa, Okla. The banquet will be on Thursday evening, the first day of the meeting.

SAVINGS IN OPERATING COST WITH NEW CARS ON GRAND RAPIDS RAILWAY

	Reduction, 1926 below 1925			
	July	August	September	October
Maintenance...	\$1,474	\$2,784	\$5,883	\$4,881
Power ...	767	1,102	1,217	1,480
Total operating saving ...	4,295	9,143	10,046	13,450

New York Railroad Club Holds Electrical Night

ELECTION of officers and other business of the annual meeting of the New York Railroad Club was taken care of Friday night, Nov. 19, in connection with the club's electrical night. The general topic for discussion was "The Relation of Transportation to Electrical Development." W. S. Jones, president of the club, presided and the subject was discussed from different viewpoints by F. Darlington, assistant vice-president Westinghouse Electric & Manufacturing Company, by J. P. Jackson, assistant vice-president New York Edison Company, and by J. C. Parker, vice-president in charge of engineering Brooklyn Edison Company. Motion pictures furnished by the General Electric Company were presented to illustrate the various stages of manufacture of Mazda lamps and to illustrate what a single drop of water contains.

The new officers elected were: President, William G. Gove, superintendent of equipment Brooklyn-Manhattan Transit Corporation; first vice-president, Eliot Sumner, superintendent of motive power Pennsylvania Railroad System; second vice-president, George Le Boutillier, vice-president Long Island Railroad; third vice-president, J. M. Davis, president Lackawanna Railroad; treasurer, David W. Pye, president Teco Products Corporation; executive member for three years, Colonel Charles Hine, consulting railroad expert, New York City; member of finance committee for three years, George T. Cooke, president American Railway Products Company; Arthur N. Dugan, vice-president Bronze Metal Company, was elected to fill out the unexpired one-year term of John T. Neff, who resigned as a member of the finance committee.

Industry Organizes for Corporation Tax Relief

REPRESENTATIVES from a large number of national manufacturing, transportation and commercial organizations in various lines of industry met in conference in Washington, D. C., on Nov. 10 to consider the formulation of a definite program for corporate tax relief to be requested of the incoming Congress. This conference was called by a committee on tax co-operation composed of the following: James A. Emery, counsel National Association of Manufacturers, chairman; R. P. Hazard representing National Association of Boot and Shoe Manufacturers, James Craig Peacock representing American Cotton Manufacturers Association, Harry L. Gandy of the National Coal Association, William S. Bennet representing the National Lumber Manufacturers' Association, McKinley W. Krieger of the American Mining Congress, and Fayette B. Dow of the National Petroleum Association. C. S. Duncan, economist Association of Railway Executives, was also added to the permanent committee organization to represent the transportation industry. Leslie Vickers, economist, attended the conference for the electric railway industry.

A presentation of the history and facts of corporate income taxation was made by James A. Emery, Counsel National Association of Manufacturers, who was elected chairman of the conference. By invitation, the under-secretary of the Treasury, Garrard B. Winston, made an informal statement of the Treasury viewpoint on taxation.

Thereafter the session was devoted to a discussion of corporate tax relief in the light of existing information and the conditions to be anticipated in a short session of the Congress. On motion of William Bennet of Chicago the following declaration was adopted:

That the present corporation income tax rate represents an invidious and inequitable discrimination against that form of business as distinguished from the individual and the partnership. The rate has been increased where all other rates have been reduced. The chairman is directed, on behalf of the conference and all co-operating associations:

1. To petition the ways and means committee for a public hearing before the meeting of Congress on the subject of corporate income tax relief.

2. That Congress be urged to repeal in the short session:

(a) The additional one-half of 1 per cent levied on corporate income and becoming effective in the calendar year 1926.

(b) Repeal the additional one-half of 1 per cent made effective for the calendar year 1925, since, from the public statement of the Treasury, one-half of 1 per cent additional for 1925 is unnecessary and the additional revenue to be derived from the further one-half of 1 per cent in 1926 will not be required.

3. That, in addition to this obviously justified permanent relief, Congress be asked to afford such further temporary and permanent relief as the fiscal circumstance of the Treasury may justify.

4. That the conference, through its executive committee, present to the joint congressional tax committee created by the revenue act of 1926 further proposals for reform of the present inequitable system of corporate taxation.

The conference requested the present National Committee on Tax Co-operation to become a permanent committee and act as the executive committee for the execution of the policies of the conference. That committee was further directed to extend an invitation to all interested organizations to join in the execution of the policy adopted.

Automotive and Rail Men Stage Transportation Meeting

Co-ordination of Highway Freight and Passenger Traffic with
Existing Rail Carriers Discussed—Design and
Maintenance Problems Receive Attention

SUBJECTS of common interest to rail and highway transportation men occupied the attention of approximately 400 members and guests of the Society of Automotive Engineers at its National Transportation and Service meeting held in Boston Nov. 16-18. A full program of papers covering in general the subjects of terminal freight handling, use of containers, co-ordination of rail and highway traffic, and including a discussion of design and maintenance problems incident to the development and operation of both freight and passenger highway vehicles, occupied attention during the meetings.

A resolution was adopted recognizing the necessity of general agreement by transportation men on the fundamentals of the relationship between highway and rail transport facilities. To define these fundamentals a joint committee was proposed, consisting of representatives from the Society of Automotive Engineers, the National Automobile Chamber of Commerce and the Railroad Motor Transport Conference.

Exception to the popular conception of the term co-ordination was taken by Prof. Lloyd Wilson of the Wharton School of Finance and Commerce, Philadelphia. There is no valid basis, his paper held, for the current belief that co-ordination involves the ownership or domination of the motor by the older instrumentalities of transportation—the steam and electric rail lines.

Practical features of bus operation were outlined by Arthur P. Russell, president New England Transportation Company. In working out its policy of protecting the passenger business of the New York, New Haven & Hartford Railroad, the bus business has been built up until the present total of rail-bus traffic equals that carried on the

rails in 1923 plus the normal expectation of increase. Mr. Russell said that about 265,000 passengers were now being carried each month, and 475,000 bus-miles operated. The cost of operation averages 29 to 30 cents a mile for the first nine months of this year. For maintenance about 10 cents a mile is spent, and for tires, 1.5 cents a mile. Fuel consumption is 5.7 miles to the gallon, and 56 miles is obtained to the quart of oil. These figures are for a fleet of 168 buses, all parlor cars except 27, which are semi-de luxe type.

The development of motor transport was compared with that of the steam railroads in the main banquet address, made by Prof. W. J. Cunningham, now of the Harvard School of Business Administration, but formerly an active railroad official. He urged as an essential of co-ordination a statesmanlike attitude by both automotive and rail groups, with a subordination of their private interest to those of the public. The competition of the motor vehicle was a healthy tonic, which has led the railroads to improve their service and equipment. Professor Cunningham said the bus operation of the Boston & Maine, New York, New Haven & Hartford, and the Great Northern Railroads was a move in the right direction. He believed the rails should take over bus service in their territory, under wise regulation.

Control of interstate motor carriers was discussed by Hon. David I. Walsh, recently elected to the United States Senate from Massachusetts. If convinced of its necessity, he promised to work for fair legislation. He pledged himself to promote the extension of the federal highway system and to help in removing the 3 per cent excise tax on automobiles which has hung over from the recent war.

Standardization on one type of bus for each class of service was recommended in a paper by G. T. Seeley, general manager Chicago Motor Coach Company, which in his absence was presented by F. C. Horner of the General Motors Corporation. Non-standardization has a far-reaching effect, according to Mr. Seeley's paper. Not only costs of maintenance and operation, but efficiency of maintenance, efficiency in service rendered and passenger revenue are influenced when many different makes are used. In discussing this paper the possibilities of a small bus, ten to fifteen passengers capacity, were brought out by C. D. Smith, general manager Beaver Valley Traction Company. This could be operated at an adequate fare to give private automobile comfort and make house-to-house solicitation of passengers. Edward F. Loomis, National Automobile Chamber of Commerce, disagreed with a statement by Mr. Seeley that at present there are few locations in which new bus installations can be made. There are many opportunities in the South as more good roads are built, also on routes where rail service is too expensive. Very few cities have given an intelligent trial to bus transportation and many more vehicles can be used as its place is better appreciated.

New Officers for Pennsylvania Association

AT A MEETING of the executive committee of the Pennsylvania Street Railway Association held in Philadelphia on Nov. 19, the resignations of Frank Phillips as president and William Bell as vice-president were received and accepted. To fill the vacancies thus created new officers were elected, as follows:

President, Jilson J. Coleman, vice-president and general manager Scranton Railway; vice-president, H. L. Mitchell, vice-president West Penn Railways; members of executive committee, T. Fitzgerald, vice-president Pittsburgh Railways, and H. F. Dicke, vice-president Lehigh Valley Transit Company.

Safety Council Elects Officers

MORE than 5,000 people drawn from twenty industries attended the fifteenth annual congress of the National Safety Council, held in Detroit Oct. 25 to 29. The electric railway section was represented by a large delegation. Many constructive methods were suggested and plans for future activities formulated. The following men were elected to hold office in the electric railway section during the ensuing business year:

Chairman, R. W. Emerson, vice-president general manager Cleveland Railway.

First vice-chairman, in charge of motor bus operation, A. W. Koehler, superintendent of accident prevention the Milwaukee Electric Railway & Light Company.

Second vice-chairman, in charge of interurban transportation problems, H. K. Bennett, safety manager United Electric Railways, Providence, R. I.

Third vice-chairman, in charge of

urban transportation problems, E. K. Eastham, safety director United Railways of St. Louis, St. Louis, Mo.

Secretary, J. J. Connors, safety director Georgia Railway & Power Company, Atlanta, Ga.

American Association News

Cleveland Gets 1927 Convention

American Electric Railway Association Executive Committee Votes Unanimously to Return to Cleveland—Adequate Car Exhibit Considered of Vital Importance to Industry

BY UNANIMOUS vote, the executive committee of the American Electric Railway Association decided to return to Cleveland for the 1927 convention, provided satisfactory arrangements can be made with the Cleveland convention committee. The date was fixed for the week of Oct. 3-7. This action followed a report made by H. B. Potter, chairman of the committee on convention location, after a careful study had been made of the facilities offered by Atlantic City and Cleveland.

The advantages offered by Cleveland from the standpoint of insuring an adequate and representative car exhibit were a large factor in this decision on convention location. The opinion was strongly expressed that a large and representative car exhibit is of utmost importance to the industry at this time and overshadows any other single element in determining the location for next year's meeting. Both the executive committee and the location committee made their decision after a very exhaustive study of the situation. J. H. Alexander, president Cleveland Railway and also chairman of the Cleveland convention committee, was invited to appear before the executive committee to explain the additional facilities that would be made available at Cleveland for the coming year. He explained that a new north wing is to be added to the Cleveland Auditorium. This will be an addition to the main auditorium building, and will be equipped with meeting rooms of various sizes, sufficient to handle all of the meetings during the convention. Entrance to this new wing will be by the grand staircase leading down from the arena floor so that exhibit space in the exhibit hall below will thereby be made more desirable. Construction of the new wing will permit taking the American Association meeting room out of the west wing, where the bus exhibit was held. It is also expected that the west wing itself will be further enlarged.

NEW HOTEL BUILDINGS TO BE AVAILABLE

Three new hotel buildings are expected to be available before next October. These consist of an addition to the Hollenden, and the new Allerton and Auditorium Hotels. The latter will be located directly across the street from the Public Auditorium. Arrangements have also been made by the Cleveland convention committee to provide improved telephone facilities and a more satisfactory arrangement for hotel room reservations than was carried out this year.

Lack of proper facilities for ade-

quately displaying electric railway cars at Atlantic City was one of the conditions which militated against that location for the next convention.

President Sawyer announced for the Charles A. Coffin prize committee that the award will be continued for 1927 and details of the competition announced at an early date. He reported a strong desire on the part of the committee in favor of recognition of more than one company by the Coffin award. The American Electric Railway Association committee is to meet with a similar committee of the National Electric Light Association and representatives of the Coffin Foundation to discuss this subject. The executive committee adopted a motion recommending that recognition be extended to more than one company in future contests.

J. N. Shannahan, national councillor representing the association on the United States Chamber of Commerce, strongly recommended an affirmative vote by the association on the various questions in Referendum No. 49 of the United States chamber on its taxation program. The secretary was instructed to communicate with electric railway member companies to urge that they use their influence in local chambers of commerce to assure affirmative votes on the questions in this referendum.

MANAGEMENT AND OPERATION COMMITTEE TO BROADEN FUNCTIONS

A letter from George H. Clifford regarding the work of the committee on management and operation was discussed. Mr. Clifford made certain suggestions for broadening the scope of this committee's activities, which received the hearty approval of the executive committee. It was decided to request Mr. Clifford to present his ideas personally to the Advisory Council at its next meeting in order that the cooperation of that body may be enlisted in working out the program suggested.

Leslie Vickers, reporting on the subject of taxation, announced that this committee is scheduled to hold a meeting on Dec. 10 at association headquarters. An advisory group of 40 members has been appointed to maintain contact with the progress of taxation legislation in various states. Mr. Vickers pointed out that local and state taxation are the primary points of attack for the committee since national taxation is a minor element in the load carried by electric railways. Mr. Vickers also gave a brief outline of the activities of the National Association of Manufacturers, which held a meeting recently in Washington to organize a

program for placing the subject of corporation tax relief before the ways and means committee in the coming session of Congress.

MANUFACTURERS PLAN BROADER CO-OPERATION

For the committee on co-operation of manufacturers, M. B. Lambert, vice-chairman, reported in the absence of Mr. Wickwire. Tentative plans contemplate broadening the scope of this committee's activities to include promotion of the development of electric railway cars and the stimulation of interest on the part of the industry in the advantages of modernized equipment. The committee also plans broadening its work so as to reflect more clearly the collective views of the manufacturers as a whole regarding current subjects before the industry.

Although the personnel of all committees has not been completed, a list of chairmen of the principal American Association committees was announced.

The list, together with the tentative committee personnel of American and affiliated associations, is published later on this and following pages.

The next meeting was set for Friday afternoon, Feb. 4, in Toledo, Ohio, at the time of the annual meeting of the Central Electric Railway Association. Those present at the meeting included the following members and guests:

President, W. H. Sawyer, J. P. Barnes, J. H. Hanna, Barron Collier, E. P. Waller, M. B. Lambert, T. W. Casey, L. E. Lippitt, C. B. Proctor, H. L. Brown, S. J. Cotsworth, E. B. Meissner, G. A. Richardson, C. E. Morgan, B. A. Hegeman, Jr., Harry Reid, Thomas Finigan, C. R. Ellicott, T. A. Kenney, Edward Dana (representing J. V. Sullivan), J. W. Welsh, C. L. Henry, C. D. Emmons, J. N. Shannahan, F. R. Coates, J. H. Alexander, Thomas Langan, Charles Gordon, H. B. Potter, H. V. Bozell, Leslie Vickers, F. C. J. Dell, G. C. Hecker, J. W. Colton, Labert St. Clair.

L. R. Nash, Boston, Mass., vice-chairman.

A. W. Brady, Anderson, Ind.
William Chamberlain, Cedar Rapids, Iowa.

F. W. Doolittle, New York, N. Y.
W. F. Ham, Washington, D. C.
A. S. Richey, Worcester, Mass.
C. E. Thompson, Highwood, Ill.

EDUCATION

Edward Dana, general manager Boston Elevated Railway, Boston, Mass., chairman.

J. S. Hyatt, Chicago, Ill., vice-chairman.

H. H. Adams, Chicago, Ill.
G. B. Anderson, Los Angeles, Cal.
A. H. Armstrong, Schenectady, N. Y.
W. H. Boyce, Pittsburgh, Pa.
W. H. Burke, Fort Worth, Tex.
J. A. Dewhurst, New York, N. Y.
M. B. Lambert, New York, N. Y.
R. J. Lockwood, St. Louis, Mo.
M. McCants, San Francisco, Cal.
F. H. Miller, Louisville, Ky.
H. H. Norris, Boston, Mass.
A. J. Rowland, Milwaukee, Wis.

FINANCE*

C. E. Morgan, vice-president and general manager Brooklyn City Railroad, Brooklyn, N. Y., chairman.

B. A. Hegeman, Jr., New York, N. Y., vice-chairman.

F. W. Doolittle, New York, N. Y.
T. A. Kenney, New York, N. Y.

*Personnel not complete.

HOOVER CONFERENCE

J. P. Barnes, president Louisville Railway, Chairman.

Complete personnel to be announced later.

INSURANCE*

P. E. Wilson, vice-president and secretary Cleveland Railway, Cleveland, Ohio, chairman.

H. B. Potter, Baltimore, Md., vice-chairman.

O. H. Bernd, Des Moines, Iowa.
A. C. Blinn, Akron, Ohio.
G. H. Bourne, New York, N. Y.
C. E. Brown, Napa, Cal.
W. C. Campbell, Chattanooga, Tenn.
N. H. Daniels, Boston, Mass.
F. M. Hamilton, Chicago, Ill.
A. D. Knox, New Haven, Conn.
F. H. Miller, Louisville, Ky.
J. H. Moran, Boston, Mass.
A. B. Paterson, New Orleans, La.
B. L. Tomes, Philadelphia, Pa.
F. J. Petura, New York, N. Y.
E. A. West, Salt Lake City, Utah.

*Personnel not complete.

MANAGEMENT AND OPERATION

G. H. Clifford, Southwestern district manager Stone & Webster, Houston, Tex., chairman.

Complete personnel to be announced later.

MEMBERSHIP

C. R. Ellicott, Eastern manager Westinghouse Traction Brake Company, New York, N. Y., chairman.

Complete personnel to be announced later.

MOTOR BUS DEPRECIATION

L. H. Palmer, vice-president and general manager Fifth Avenue Coach Company, New York, N. Y., chairman.

R. H. Pinkley, Milwaukee, Wis., vice-chairman.

M. W. Glover, Pittsburgh, Pa.
F. C. Horner, New York, N. Y.

Committee Appointments Announced

American and Affiliated Associations Make Selections for Handling the Work During Coming Year—Additional Appointments Will Be Announced Later

ORGANIZATION of committees of American Electric Railway Association and the affiliated Accountants', Claims, Engineering and Transportation & Traffic Associations is progressing rapidly. The Engineering Association committees are virtually all completed, save for a few acceptances which have not yet been received. Several of the American Association committees are complete and have organized, while invitations for the remainder are still being sent out. The same is true of the other associations.

A list of the committee members who have been chosen and who have accepted their appointments is given below. As indicated, in a number of instances additional appointments may be announced. More complete lists will be published as the information becomes available.

American Association

CHARLES A. COFFIN PRIZE

W. H. Sawyer, president American Electric Railway Association, care of East St. Louis & Suburban Railway, East St. Louis, Ill., chairman.

James H. McGraw, New York, N. Y.
R. P. Stevens, New York, N. Y.

CONVENTION LOCATION

H. B. Potter, general manager United Railways & Electric Company, Baltimore, Md., chairman.

C. E. Morgan, New York, N. Y.
J. H. Alexander, Cleveland, Ohio.
G. B. Anderson, Los Angeles, Cal.
F. G. Buffe, Kansas City, Mo.
G. H. Clifford, Houston, Tex.
Edward Dana, Boston, Mass.
B. J. Fallon, Chicago, Ill.
H. B. Flowers, New Orleans, La.
Charles Gordon, New York, N. Y.
J. P. Griffin, Dallas, Tex.
D. W. Harvey, Toronto, Ont.
C. S. Hawley, Albany, N. Y.

A. L. Kasemeier, Winton Place, Ohio.

H. J. Kenfield, Chicago, Ill.

G. L. Kippenberger, St. Louis, Mo.

S. P. McGough, Chicago, Ill.

J. C. McQuiston, East Pittsburgh, Pa.

A. L. Price, Mansfield, Ohio.

A. J. Purinton, Atlantic City, N. J.

J. A. Ritchie, Chicago, Ill.

A. M. Robinson, Philadelphia, Pa.

L. W. Shugg, Schenectady, N. Y.

D. W. Snyder, Jr., Springfield, Ill.

S. B. Way, Milwaukee, Wis.

E. A. West, Salt Lake City, Utah.

Walter White, Cleveland, Ohio.

CO-OPERATION WITH MANUFACTURERS

E. F. Wickwire, vice-president Ohio Brass Company, Mansfield, Ohio, chairman.

M. B. Lambert, New York, N. Y., vice-chairman.

W. H. Boyce, Pittsburgh, Pa.

H. B. Doyle, New York, N. Y.

H. J. Kenfield, Chicago, Ill.

E. B. Meissner, St. Louis, Mo.

G. R. Rowland, New York, N. Y.

J. P. Sloan, New York, N. Y.

L. F. Stoll, New York, N. Y.

E. P. Waller, Schenectady, N. Y.

CO-OPERATION WITH MOTOR VEHICLE INDUSTRY

Lucius S. Storrs, managing director American Electric Railway Association, New York, N. Y., chairman.

R. P. Stevens, New York, N. Y., vice-chairman.

A. W. Brady, Anderson, Ind.

C. D. Emmons, Baltimore, Md.

E. W. Wakelee, Newark, N. J.

CO-OPERATION WITH STATE AND SECTIONAL ASSOCIATIONS

F. R. Coates, Henry L. Doherty & Company, New York, N. Y., chairman.

Complete personnel to be announced later.

DEPRECIATION

J. H. Hanna, president Capital Traction Company, Washington, D. C., chairman.

H. A. Johnson, Chicago, Ill.
L. A. May, New Haven, Conn.
G. H. Scragg, New York, N. Y.

MOTOR VEHICLE INFORMATION

R. P. Stevens, president Penn-Ohio Edison Company, New York, N. Y., chairman.

J. H. Alexander, Cleveland, Ohio.
C. H. Beck, New York, N. Y.
M. R. Boylan, Newark, N. J.
L. C. Bradley, Richmond, Va.
F. G. Buffe, Kansas City, Mo.
H. B. Flowers, New Orleans, La.
M. B. Lambert, New York, N. Y.
D. W. Pontius, Los Angeles, Cal.
Harry Reid, Indianapolis, Ind.
W. B. Tuttle, San Antonio, Tex.
E. P. Waller, Schenectady, N. Y.
S. B. Way, Milwaukee, Wis.

NATIONAL RELATIONS

Harry Reid, president Interstate Public Service Company, Indianapolis, Ind., chairman.

Frank Karr, Los Angeles, Cal., vice-chairman.

R. R. Bradley, Chicago, Ill.
A. W. Brady, Anderson, Ind.
C. D. Cass, Waterloo, Iowa.
G. H. Clifford, Houston, Tex.
Thomas Finigan, Chicago, Ill.
J. H. Hanna, Washington, D. C.
G. H. Harries, Chicago, Ill.
C. L. Henry, Indianapolis, Ind.
L. R. Nash, Boston, Mass.
Frank Silliman, Jr., New York, N. Y.
D. W. Snyder, Jr., Springfield, Ill.
F. H. Wilson, Cleveland, Ohio.

POLICY

R. P. Stevens, president Penn-Ohio Edison Company, New York, N. Y., chairman.

J. P. Barnes, Louisville, Ky., vice-chairman.

H. L. Brown, Mansfield, Ohio.
C. R. Ellicott, New York, N. Y.
L. H. Palmer, New York, N. Y.
J. N. Shannahan, Newport News, Va.

PUBLICITY*

Paul Shoup, president Pacific Electric Railway, San Francisco, Cal., chairman.

Barron Collier, New York, N. Y., vice-chairman.

E. J. Dickson, Providence, R. I.
Robert Dougan, Washington, D. C.
C. S. McCalla, Youngstown, Ohio.
M. P. Rice, Schenectady, N. Y.
A. C. Watt, New York, N. Y.
E. F. Wickwire, Mansfield, Ohio.

*Personnel not complete.

PUBLIC SPEAKING

Complete personnel to be announced later.

PUBLICATIONS

J. H. Hanna, president Capital Traction Company, Washington, D. C., chairman.

Complete personnel to be announced later.

RAPID TRANSIT

G. A. Richardson, vice-president and general manager Chicago Surface Lines, Chicago, Ill., chairman.

J. H. Alexander, Cleveland, Ohio, vice-chairman.

H. L. Andrews, Schenectady, N. Y.
W. B. Bennett, St. Louis, Mo.
Edward Dana, Boston, Mass.
J. S. Doyle, New York, N. Y.
S. E. Emmons, Baltimore, Md.
H. E. Ehlers, Philadelphia, Pa.
B. J. Fallon, Chicago, Ill.

Thomas Fitzgerald, Pittsburgh, Pa.
R. F. Kelker, Jr., Chicago, Ill.
E. J. McIlraith, Chicago, Ill.
W. S. Menden, Brooklyn, N. Y.
D. W. Pontius, Los Angeles, Cal.
F. H. Shepard, New York, N. Y.
C. E. Smith, St. Louis, Mo.
D. L. Turner, New York, N. Y.
James Walker, Chicago, Ill.

REVISION OF CONSTITUTION AND BY-LAWS

C. D. Emmons, president United Railways & Electric Company, Baltimore, Md., chairman.

J. H. McGraw, New York, N. Y., vice-chairman.

J. G. Barry, Schenectady, N. Y.
H. V. Bozell, New York, N. Y.
H. L. Brown, Mansfield, Ohio.
H. G. Clark, Newark, N. J.
F. W. Doolittle, New York, N. Y.
J. E. Hutcheson, Montreal, Que.
M. B. Lambert, New York, N. Y.
E. B. Meissner, St. Louis, Mo.
L. H. Palmer, New York, N. Y.
Harry Reid, Indianapolis, Ind.
G. A. Richardson, Chicago, Ill.
Paul Shoup, San Francisco, Cal.
R. P. Stevens, New York, N. Y.

SUBJECTS AND MEETINGS

H. L. Brown, secretary the Ohio Brass Company, Mansfield, Ohio, chairman.

Complete personnel to be announced later.

TAXATION

A. T. Davison, general counsel Third Avenue Railway System, New York, N. Y., chairman.

E. W. Wakelee, Newark, N. J., vice-chairman.

C. H. Allen, Chicago, Ill.
H. L. Geisse, Wausau, Wis.
J. P. Griffin, Dallas, Tex.
W. A. Jackson, Milwaukee, Wis.
D. J. Hennessey, Pittsburgh, Pa.
H. A. Mitchell, Oakland, Cal.
L. R. Nash, Boston, Mass.
B. J. Strouse, Minneapolis, Minn.
C. L. S. Tingley, New York, N. Y.
A. C. Watt, New York, N. Y.
P. E. Wilson, Cleveland, Ohio.

Representatives of the Association on Other National Organizations

AMERICAN COMMITTEE ON INDUCTIVE CO-ORDINATION

R. P. Stevens, president Penn-Ohio Edison Company, New York, N. Y., chairman.

Complete personnel to be announced later.

NATIONAL INDUSTRIAL CONFERENCE BOARD

F. R. Coates, Henry L. Doherty & Company, New York, N. Y.

J. N. Shannahan, care of Old Dominion Land Company, Newport News, Va.

UNITED STATES CHAMBER OF COMMERCE
J. N. Shannahan, care of Old Dominion Land Company, Newport News, Va., national councillor.

J. H. Hanna, president the Capital Traction Company, Washington, D. C., substitute national councillor.

Accountants' Association

Complete personnel of all committees in this association to be announced later.

BUS ACCOUNTING

M. W. Glover, general auditor West

Penn Railways, Pittsburgh, Pa., chairman.

CONVENTION PROGRAM

E. H. Reed, auditor Brooklyn City Railroad, Brooklyn, N. Y., chairman.

ENGINEERING ACCOUNTING

T. B. McRae, general auditor Chicago, North Shore & Milwaukee Railroad, Highland, Ill., co-chairman.

FARE COLLECTION

E. A. Tuson, general auditor Public Service Railway, Newark, N. J., chairman.

FREIGHT ACCOUNTING

O. H. Bernd, secretary Des Moines City Railway, Des Moines, Iowa, chairman.

REVIEW OF PROCEEDINGS

J. E. Heberle, secretary Capital Traction Company, Washington, D. C., chairman.

STANDARD CLASSIFICATION OF ACCOUNTS

M. W. Glover, general auditor West Penn Railways, Pittsburgh, Pa., chairman.

STORES ACCOUNTING

Claims Association

BONUS AND AWARD SYSTEM

G. T. Hellmuth, general claims attorney Chicago, North Shore & Milwaukee Railroad, Chicago, Ill., chairman.

B. D. Haskins, Chattanooga, Tenn.
A. W. Koehler, Milwaukee, Wis.

MEDICAL AND SURGICAL WORK

Personnel of this committee to be announced later.

EMPLOYMENT

Personnel of this committee to be announced later.

JOINT COMMITTEE ON TRAFFIC AND SAFETY*

H. K. Bennett, safety manager United Electric Railways, Providence, R. I., co-chairman.

Seth Baldwin, New Haven, Conn.

A. G. Jack, Wilmington, Del.

V. T. Noonan, Chicago, Ill.

E. J. Paige, Baltimore, Md.

J. J. Reynolds, Boston, Mass.

J. J. Sharkey, Rochester, N. Y.

R. A. Sears, Boston, Mass., sponsor.

*Personnel not complete.

Engineering Association

ENGINEERING SYMBOLS

Co-operate with association's representatives on the A.E.S.C. sectional committee on engineering symbols and abbreviations.

H. W. Coddington, assistant engineer Public Service Production Company, Newark, N. J., chairman.

G. H. Haldeman, Newark, N. J.

J. D. Kent, New York, N. Y.

W. J. Quinn, New York, N. Y.

C. W. Squier, New York, N. Y.

PURCHASES AND STORES

1. Review existing purchases and stores sections of the Manual for revisions and corrections.

2. Continue study of and make recommendations regarding the disposal of unused inactive material.

3. Make a further study of routine methods to be followed in the purchases and

stores departments recommending that a report be made on a uniform method of distributing materials by supply trains or trucks.

4. Recommend that a uniform practice of testing or inspecting materials be adopted by testing or inspecting materials on receipt or at factory.

J. Fleming, assistant secretary and purchasing agent the Capital Traction Company, Washington, D. C., chairman.

J. Y. Bayliss, Richmond, Va.
A. S. Duncan, East Pittsburgh, Pa.
A. L. Fischer, Cincinnati, Ohio.
B. W. Forkner, Mansfield, Ohio.
A. E. Hatton, Pittsburgh, Pa.
F. A. Jordan, Atlanta, Ga.
P. F. McCall, Highwood, Ill.
T. H. McGarry, Boston, Mass.
A. A. Ordway, Boston, Mass.
W. E. Scott, Philadelphia, Pa.
C. Thorburn, Los Angeles, Cal.
W. J. Walker, Schenectady, N. Y.
P. V. C. See, Akron, Ohio, sponsor.

POWER TRANSMISSION AND DISTRIBUTION

1. Review existing Manual sections; in particular keep in touch with the work of the A.E.S.C. sectional committees on the National Electrical Safety Code and on overhead line materials.
2. Continue the study of specifications for material for catenary construction.
3. Continue study of trolley wire wear and breaks.
4. Continue to confer with the A.S.T.M. in an effort to improve the specification for bronze trolley wire.
5. Continue the investigation of radio interference.
6. Continue the study of inductive co-ordination.
7. Study the proper design of the distribution layout for automatic substations.
8. Consider the advisability and possibility of establishing a standard by which various methods of operating and maintaining overhead lines may be compared.
9. Study subject of standardization of trolley wire reels.

F. McVittie, electrical engineer New York State Railways, Rochester, N. Y., chairman.

J. W. Allen, Boston, Mass.
S. H. Anderson, Los Angeles, Cal.
W. H. Bassett, Waterbury, Conn.
M. W. Cooke, Pittsburgh, Pa.
J. H. Drew, Mansfield, Ohio.
D. D. Ewing, Lafayette, Ind.
C. L. Hancock, New York, N. Y.
S. S. Hertz, New York, N. Y.
K. J. Keith, Des Moines, Iowa.
A. J. Klatte, Chicago, Ill.
John Leisenring, Springfield, Ill.
H. S. Murphy, Philadelphia, Pa.
J. F. Neild, Toronto, Ont.
W. J. Quinn, New York, N. Y.
M. B. Rosevear, Camden, N. J.
W. Schaake, East Pittsburgh, Pa.
A. Schlesinger, Indianapolis, Ind.
D. L. Smith, Chicago, Ill.
R. E. Wade, Schenectady, N. Y.
G. F. Wennagel, Baltimore, Md.
C. H. Jones, Michigan City, Ind., sponsor.

HEAVY ELECTRIC TRACTION

1. Review existing Manual sections.
2. Continue study of track and third rail bonds.
3. Bibliography of heavy electric traction and electrification data; bring up to date if publication is approved.
4. Continue study and collection of data on branch line electrification and self-propelled cars.
5. Continue study of train operation with particular reference to articulated trains.
6. Study train make-up and terminal switching with multiple-unit cars.

H. F. Brown, assistant electrical engineer New York, New Haven & Hartford Railroad, New Haven, Conn., chairman.

A. H. Armstrong, Schenectady, N. Y.
J. M. Bosenbury, Springfield, Ill., vice-chairman.

Morris Buck, New York, N. Y.
H. W. Cope, East Pittsburgh, Pa.
A. H. Daus, Chicago, Ill.
J. C. Davidson, Schenectady, N. Y.
J. H. Davis, Baltimore, Md.
J. V. B. Duer, Altoona, Pa.
J. T. Hamilton, New York, N. Y.
E. C. Johnson, Los Angeles, Cal.
J. O. Madison, New York, N. Y.
M. W. Manz, Mansfield, Ohio.
L. S. Wells, New York, N. Y.
A. H. Woollen, Chicago, Ill.
F. H. Miller, Louisville, Ky., sponsor.

ENGINEERING ACCOUNTING

Review the standard classification of accounts for electric railways and make such suggestions for changes as seem desirable to the committee on standard classification of accounts of the Accountants' Association.

E. D. Dreyfus, advisory engineer West Penn Railways, Pittsburgh, Pa., chairman.

E. J. Dickson, Providence, R. I.
C. R. Harte, New Haven, Conn.
R. B. Rifenberick, Detroit, Mich.

UNIFICATION OF CAR DESIGN

Study report of committee on essential features of modern cars and review comments on that report with the view of continuing the work of that committee.

H. H. Adams, superintendent of shops and equipment Chicago Surface Lines, Chicago, Ill., chairman.

Complete personnel of this committee to be announced later.

WOOD PRESERVATION

1. Review existing Manual sections for revision and correction.
2. Study of treatment of poles and timber in place.
3. Study actual economies obtained by operating utilities through the use of treated timbers.
4. Study methods and forms of keeping continuous records of treated timber.
5. Study wood preservatives other than creosote and zinc chloride.

C. A. Smith, superintendent of roadway, Georgia Railway & Power Company, Atlanta, Ga., chairman.

M. J. Curtin, Charlestown, Mass.
T. H. David, Indianapolis, Ind.
J. L. Fritsch, Pittsburgh, Pa.
W. H. Fulweiler, Philadelphia, Pa.
E. F. Hartmen, Kenilworth, N. J.
W. L. Harwood, Springfield, Mass.
L. P. Scanlan, Newark, N. J.
F. H. Swayze, New York, N. Y.
A. P. Way, Philadelphia, Pa.
R. H. White, Jr., Atlanta, Ga.
W. F. Graves, Indianapolis, Ind., sponsor.

POWER GENERATION AND CONVERSION

1. Review existing Manual sections.
2. Continue study of ventilation of automatic substations.
3. Continue study of mercury arc power rectifiers.
4. Economical trolley potential to be supplied for congested districts of urban systems.

W. E. Bryan, superintendent of power United Railways of St. Louis, St. Louis, Mo., chairman.

C. E. Bennett, Atlanta, Ga.
C. A. Butcher, East Pittsburgh, Pa.
H. W. Coddington, Newark, N. J.
H. A. Kidder, New York, N. Y.
N. R. Love, Denver, Col.
H. W. McRobbie, Connellsville, Pa.
F. W. Peters, Schenectady, N. Y.
W. S. Richhart, Fort Wayne, Ind.
G. W. Saathoff, New York, N. Y.
L. J. Turley, Los Angeles, Cal.

R. L. Weber, Boston, Mass.
R. G. Winans, New York, N. Y.
G. I. Wright, Chicago, Ill.
L. D. Bale, Cleveland, Ohio, sponsor.

ENGINEERING MANUAL

R. H. Dalglish, chief engineer the Capital Traction Company, Washington, D. C., chairman.

W. F. Graves, Indianapolis, Ind.
C. H. Jones, Michigan City, Ind.
F. H. Miller, Louisville, Ky.

SUBJECTS

F. H. Miller, vice-president and general manager Louisville Railway, Louisville, Ky., chairman.

Morris Buck, New York, N. Y.
W. F. Graves, Indianapolis, Ind.
C. H. Jones, Michigan City, Ind.
P. V. C. See, Akron, Ohio.

REVISION OF RULES AND PROCEDURE

A special committee on the revision of rules for the preparation of committee reports and specifications and also the procedure for the adoption of standards.

F. H. Miller, vice-president and general manager Louisville Railway, Louisville, Ky., chairman.

L. D. Bale, Cleveland, Ohio.
P. V. C. See, Akron, Ohio.
H. H. George, Newark, N. J.
A. T. Clark, Baltimore, Md.

STANDARDS

This committee will pass on standards proposed by committees other than those in the equipment division and the way and structures division, which are passed on by the standing committees on those subjects.

C. R. Harte, construction engineer the Connecticut Company, New Haven, Conn., chairman.

L. D. Bale, Cleveland, Ohio.
C. C. Beck, Mansfield, Ohio.
L. C. Datz, St. Louis, Mo.
C. M. Davis, Schenectady, N. Y.
F. C. Hanker, East Pittsburgh, Pa.
C. H. Jones, Michigan City, Ind.
C. G. Keen, New York, N. Y.
M. B. Rosevear, Camden, N. J.
J. M. Waldron, New York, N. Y.

Rolling Stock Division

STANDING COMMITTEE

A. T. Clark, superintendent rolling stock and shops United Railways & Electric Company of Baltimore, Baltimore, Md., chairman.

J. A. Brooks, Philadelphia, Pa.
W. W. Brown, Brooklyn, N. Y.
R. S. Bull, Pittsburgh, Pa., vice-chairman.

M. R. Hanna, Schenectady, N. Y.
J. M. Hipple, East Pittsburgh, Pa.
J. S. McWhirter, New York, N. Y.
A. D. McWhorter, Memphis, Tenn.
T. H. Nicholl, Anderson, Ind.
R. B. Smyth, Boston, Mass.
W. G. Stuck, Lexington, Ky.
H. S. Williams, Detroit, Mich.

1—MANUAL REVIEW

Review existing Manual sections on rolling stock for revision and correction.

C. W. Squier, associate editor ELECTRIC RAILWAY JOURNAL, New York, N. Y., chairman.

W. S. Adams, Philadelphia, Pa.
T. H. Nicholl, Anderson, Ind.
H. S. Williams, Detroit, Mich.

2—MOTOR COACHES*

1. Continue study of motor coach design and consider motor coach standardization.

2. Investigate maintenance methods and inspection schedules in motor coach operation.

V. W. Berry, assistant general manager of railways Virginia Electric & Power Company, Richmond, Va., chairman.

H. L. Debbink, Milwaukee, Wis.
W. D. Downey, Philadelphia, Pa.
C. W. Stocks, New York, N. Y.

*Personnel not complete.

3—CAR EQUIPMENT

Continue study of car equipment with special reference to appearance, comfort and convenience.

H. S. Williams, assistant superintendent of equipment Department of Street Railways, Detroit, Mich., chairman.

O. H. Basquin, Chicago, Ill.
J. A. Dewhurst, New York, N. Y.
F. J. Foote, Springfield, Ohio.
H. J. Jonas, Cincinnati, Ohio.
G. L. Kippenberger, St. Louis, Mo.
C. R. McMahon, Des Moines, Iowa.
W. R. McRae, Toronto, Ont.

4—LIGHTING

Continue study of car lighting.

R. W. Cost, Illumination Bureau, Westinghouse Lamp Company, New York, N. Y., chairman.

A. L. Broe, Harrison, N. J.
W. W. Brown, Brooklyn, N. Y.
H. F. Deininger, Philadelphia, Pa.
H. A. Otis, Chicago, Ill.
J. P. Staples, Charleroi, Pa.

5—BEARINGS*

Study results being obtained with roller bearings for journals.

W. C. Bolt, superintendent rolling stock and shops Eastern Massachusetts Street Railway, Chelsea, Mass., chairman.

V. N. DeLamater, Newark, N. J.
E. M. Lunda, Grand Rapids, Mich.
W. C. Sanders, Canton, Ohio.

*Personnel not complete.

6—LUBRICATION

Study methods of gear lubrication.

W. G. Stuck, superintendent of equipment Kentucky Traction & Terminal Company, Lexington, Ky., chairman.

A. A. Green, New York, N. Y.
L. W. Jacques, East St. Louis, Ill.
J. F. Lamb, New York, N. Y.
J. H. Lucas, Milwaukee, Wis.

7—AIR COMPRESSORS

Investigate suction strainers for air compressors.

J. C. McCune, assistant director of engineering, Westinghouse Air Brake Company, New York, N. Y., chairman.

C. A. Ives, Erie, Pa.
A. F. Rexroth, Harrisburg, Pa.
P. J. Wood, Erie, Pa.

8—MOTOR BRUSHES

Investigate side wear on brushes of ventilated motors.

R. A. Hutchins, General Electric Company, Schenectady, N. Y., chairman.

F. T. McCann, Syracuse, N. Y.
F. W. McCloskey, East Pittsburgh, Pa.

R. D. Voshall, Washington, D. C.

9—NOISE REDUCTION

Continue study of reduction of noise in car operation.

H. S. Williams, assistant superintendent of equipment Department of Street Railways, Detroit, Mich., chairman.

C. Bethel, East Pittsburgh, Pa.
L. J. Davis, Brooklyn, N. Y.
C. J. Ellis, Winton Place, Ohio.
M. Guynes, Schenectady, N. Y.
F. L. Hinman, Philadelphia, Pa.
T. H. Minary, Louisville, Ky.
R. M. O'Brien, New Orleans, La.
H. L. Rogers, Cincinnati, Ohio.

10—GEAR

Study helical and spur gearing including long and short addendum teeth together with the entire subject of gearing.

Personnel of this committee will be announced later.

11—CURRENT COLLECTING DEVICES

Study overhead collecting devices and recommend standards for trolley wheels.

Hugh Savage, superintendent of equipment the Brooklyn City Railroad, Brooklyn, N. Y., chairman.

W. C. Klein, Allentown, Pa.
H. S. Murphy, Philadelphia, Pa.
D. L. Smith, Chicago, Ill.

Way and Structures Division

STANDING COMMITTEE

H. H. George, assistant to chief engineer Public Service Production Company, Newark, N. J., chairman.

C. A. Alden, Steelton, Pa.
E. B. Entwistle, Johnstown, Pa.
W. G. Hulbert, Easton, Pa.
J. R. McKay, Fort Wayne, Ind.
E. J. McIlraith, Chicago, Ill.
H. F. Merker, Brooklyn, N. Y.
E. M. T. Ryder, New York, N. Y., vice-chairman.

C. A. Smith, Atlanta, Ga.
A. T. Spencer, Toronto, Ont.
H. M. Steward, Boston, Mass.
W. W. Wysor, Baltimore, Md.

1—MANUAL REVIEW

Review existing Manual sections on way and structures for revision and correction.

W. R. Dunham, Jr., executive engineer Department of Street Railways, Detroit, Mich., chairman.

D. J. Graham, Youngstown, Ohio.
J. S. Mahan, Chicago, Ill.
D. H. Walker, Indianapolis, Ind.
T. H. Davis, Indianapolis, Ind.

2—SWITCH TONGUES AND HARD CENTERS

1. Continue study of design of switch tongues and hard centers for special trackwork.

2. Co-operate with way and structures committee No. 5.

E. M. T. Ryder, way engineer Third Avenue Railway, New York, N. Y., chairman.

C. A. Alden, Steelton, Pa.
R. B. Fisher, Harvey, Ill.
H. F. Heyl, Easton, Pa.
G. A. Peabody, Cleveland, Ohio.
W. W. Wysor, Baltimore, Md.

3—RAILS

Investigate relative advantages of 7-in. and 9-in. girder rails for track construction in paved streets.

H. F. Merker, chief engineer way and structures Brooklyn City Railroad, Brooklyn, N. Y., chairman.

J. U. Bragg, Baltimore, Md.
G. H. Haldeman, Newark, N. J.
R. M. Hannaford, Montreal, Que.
E. S. Meyers, New Orleans, La.

J. F. Rodgers, Philadelphia, Pa.
Oscar Williams, Pittsburgh, Pa.

4—TRACK BALLAST AND DRAINAGE

1. Study matter of type of ballast for track construction in paved streets to determine the relative advantages of each type with special conditions of sub-soil, car loadings, etc.

2. Investigate the use of vitrified or tile pipe auxiliary drains in connection with track construction in paved streets.

S. Clay Baker, engineer maintenance of way East St. Louis & Suburban Railway, East St. Louis, Ill., chairman.
E. J. Archambault, Milwaukee, Wis.
L. T. Botto, San Antonio, Tex.
A. C. Eddy, Vancouver, B. C.
C. L. Hawkins, St. Louis, Mo.
J. H. Haylow, Memphis, Tenn.

5—SPECIAL TRACKWORK

1. Review specifications for castings in ironbound, hard center special trackwork, with a view to possible revision of requirements for depth of casting and general design.

2. Co-operate with way and structures committee No. 2.

E. P. Roundey, engineer way and structures New York State Railways, Utica, N. Y., chairman.

C. A. Alden, Steelton, Pa.
J. U. Bragg, Baltimore, Md.
E. B. Entwistle, Johnstown, Pa.
W. G. Hulbert, Easton, Pa.
M. M. Johnston, New Haven, Conn.
D. R. Payne, Hoboken, N. J.

6—ARC WELDING

1. Study arc welding processes for repairs to rails and manganese steel.

2. Prepare welding wire specifications.

Chester F. Gailor, consulting engineer, New York, N. Y., chairman.

H. E. Bean, Syracuse, N. Y.
H. H. Dartt, Scranton, Pa.
A. L. Donnelly, New Haven, Conn.
R. B. Fehr, Cleveland, Ohio.
E. L. Lockman, Boston, Mass.
I. C. Newman, Norfolk, Va.
W. M. Raiguel, Philadelphia, Pa.
Jonathan Wolfe, Chicago, Ill.

7—ALLOY STEELS OTHER THAN MANGANESE

Investigate the possibilities from the use of other alloy steels than manganese for special trackwork purposes.

A. T. Spencer, assistant to general manager Toronto Transportation Commission, Toronto, Ont., chairman.

R. B. Fehr, Cleveland, Ohio.
F. G. Hibbard, Milwaukee, Wis.
E. F. Kenney, Bethlehem, Pa.
P. A. Kerwin, Detroit, Mich.
B. P. Legare, San Francisco, Cal.
R. H. Noderer, Johnstown, Pa.
O. C. Rehfuess, Montreal, Que.
F. B. Walker, Boston, Mass.

8—PAVEMENT

Study the effect of the increasing use of rubber-tired vehicles on the type of pavement required for track in paved streets to meet heavy vehicular traffic conditions.

A. E. Harvey, superintendent way and structures Kansas City Public Service Company, Kansas City, Mo., chairman.

N. R. Alexander, Chicago, Ill.
C. W. Burke, Brooklyn, N. Y.
W. O. Matthews, Denver, Col.
J. M. Sundmaker, Cincinnati, Ohio.
W. L. Wilson, Des Moines, Iowa.

9—BUS GARAGE DESIGN

1. Study the effect of garage design on insurance rates including such items as (a) types of heating plants; (b) design of inspection pits; (c) gas, oil and water servicing facilities for buses; (d) floor drain-

age; (e) ventilation; (f) fire extinguishing apparatus including automatic sprinklers.
 2. Study of door design.
 3. Study of maximum floor grades.
 4. Study of illumination, both natural and artificial.
 5. Study bus washing facilities.
 6. Study provisions for compressed air lines for inflating tires.

J. R. McKay, chief engineer Indiana Service Corporation, Fort Wayne, Ind., chairman.

A. J. Blackburn, Boston, Mass.
 G. H. Haldeman, Newark, N. J.
 Adrian Hughes, Jr., Baltimore, Md.
 L. F. Parlette, Philadelphia, Pa.
 W. W. Wise, New York, N. Y.

10—CARHOUSE AND SHOP CONSTRUCTION AND WIRING

Co-operate with the National Fire Protection Association if any revision of the existing rules for carhouses or the formulation of a similar set of rules for car shops is undertaken by that association.

H. E. Bachman, superintendent of distribution Public Service Railway, Newark, N. J., chairman.

E. P. Goucher, Washington, D. C.
 J. D. Kent, New York, N. Y.

11—TRACK CONSTRUCTION

Co-operate with A.S.M.E. in the consideration of any changes in the track construction specifications which may be proposed by either organization.

C. L. Hawkins, engineer way and structures United Railways of St. Louis, St. Louis, Mo., chairman.

W. R. Dunham, Jr., Detroit, Mich.
 H. H. George, Newark, N. J.
 E. M. T. Ryder, New York, N. Y.
 W. W. Wyso, Baltimore, Md.

12—RAIL CORRUGATION

Continue study of rail corrugation.

W. W. Wyso, chief engineer United Railways & Electric Company, Baltimore, Md., chairman.

C. H. Clark, Cleveland, Ohio.
 E. B. Entwistle, Johnstown, Pa.
 D. D. Ewing, Lafayette, Ind.
 R. B. Fehr, Cleveland, Ohio.
 H. F. Flowers, Findlay, Ohio.
 C. R. Kinnear, Toronto, Ont.
 T. J. Lavan, Cleveland, Ohio.
 E. L. Lockman, Boston, Mass.
 A. M. Nardini, Philadelphia, Pa.
 J. Ormondroyd, East Pittsburgh, Pa.
 H. J. Tippet, New Haven, Conn.
 C. L. Van Auken, Chicago, Ill.
 H. S. Williams, Detroit, Mich., vice-chairman.

13—DESIGN OF JOINT RAILWAY AND BUS TERMINALS*

Study design of joint railway and bus terminals.

C. W. Gifford, general superintendent Gary Railways, Gary, Ind., chairman.
 E. D. Eckroad, Akron, Ohio.

*Personnel not complete.

14—LIGHT SECTION RAIL*

Investigate need for a lighter section than the present 7-in. grooved girder rail.

C. A. Alden, chief engineer frog and switch division Bethlehem Steel Company, Bethlehem, Pa., chairman.

C. G. Keen, New York, N. Y.

*Personnel not complete.

15—TRACK GAGE

Prepare a design of gage for checking gage of track.

C. H. Clark, engineer maintenance of way the Cleveland Railway, Cleveland, Ohio, chairman.

Complete personnel of this committee to be announced later.

Transportation & Traffic Association

SERVICE BETTERMENT*

S. E. Emmons, assistant general manager United Railways & Electric Company of Baltimore, chairman.

C. D. Smith, New Brighton, Pa., vice-chairman.

F. J. Denney, Detroit, Mich.
 J. A. Dewhurst, New York, N. Y.
 C. H. Evenson, Chicago, Ill.
 W. J. Flickinger, New Haven, Conn.
 A. L. Hodges, Brooklyn, N. Y.
 E. A. Palmer, East Pittsburgh, Pa.
 A. E. Potter, Providence, R. I.
 A. C. Spurr, Wheeling, W. Va.
 J. C. Thirlwall, Schenectady, N. Y.
 W. E. Thompson, New York, N. Y.
 G. B. Anderson, Los Angeles, Cal., sponsor.

Edward Dana, Boston, Mass, sponsor.

*Personnel not complete.

BUS OPERATION

R. N. Graham, manager of railways the Pennsylvania-Ohio Electric Company, Youngstown, Ohio, chairman.

E. D. Dreyfus, Pittsburgh, Pa.
 B. W. Arnold, Milwaukee, Wis., vice-chairman.

C. H. Chapman, Waterbury, Conn.
 D. L. Fennell, Kansas City, Mo.
 S. W. Greenland, St. Louis, Mo.
 M. L. Harry, Decatur, Ill.
 Adrian Hughes, Jr., Baltimore, Md.
 D. A. Scanlon, Akron, Ohio.
 Alexander Shapiro, Washington, D. C.
 A. T. Warner, Newark, N. J.
 H. M. Bollum, Minneapolis, Minn.
 Thomas Noonan, Pittsburgh, Pa.
 J. L. Alexander, Houston, Tex.
 D. W. Harvey, Toronto, Ont.
 E. S. Pardoe, Washington, D. C.
 A. R. Myers, Erie, Pa., sponsor.
 P. E. Wilson, Cleveland, Ohio, sponsor.

JOINT COMMITTEE ON TRAFFIC AND SAFETY

Personnel of this committee to be announced later.

SUBJECTS AND PROGRAM

W. F. Weh, superintendent accident department the Cleveland Railway, Cleveland, Ohio, chairman.

H. V. Drown, Newark, N. J.
 W. H. Renaud, Jr., New Orleans, La.

Revision of Constitution and By-Laws

AN ORGANIZATION meeting of the committee on revision of the constitution and by-laws of the American Electric Railway Association was held at association headquarters on Nov. 18, with the following members present: C. D. Emmons, chairman; James H. McGraw, vice-chairman; E. P. Waller, Harry Reid, Harold V. Bozell, M. B. Lambert, G. A. Richardson, H. L. Brown, L. H. Palmer and President W. H. Sawyer.

Several questions came before the committee regarding the constitution of the association. These include the rate and distribution of dues, membership of bus operating companies, membership of municipally owned properties, name of the association, titles and designations of association staff members, together with such other changes in the constitution as may be suggested

by careful study of changed conditions in the industry since its last revision.

The subject of the association name was referred to a sub-committee consisting of H. V. Bozell, Harry Reid, M. B. Lambert, L. H. Palmer and G. A. Richardson. Another sub-committee including James H. McGraw, chairman; E. P. Waller, L. H. Palmer, Harlow Clark, R. P. Stevens and F. W. Doolittle was delegated to study the subject of dues with a view to making the income of the association cover all activities, including the expense of the Advisory Council, without resorting to special assessments or contributions. This work is to be carried on in co-operation with the finance committee. H. L. Brown was made chairman of a sub-committee to review carefully the entire wording of the present constitution and to suggest necessary changes. H. V. Bozell and M. B. Lambert were also named to this sub-committee.

Bus Operation

AN ORGANIZATION meeting of the committee on bus operation was held at association headquarters on Nov. 18 and various suggestions for the year's work were reviewed. Subject assignments were made to various sub-committees who are to prepare preliminary reports for presentation at the next meeting of the committee, which is to be held in Toledo, Ohio, at the time of the Central Electric Railway Association annual meeting on Feb. 3.

Subject No. 1—*Bus Operating Rules and Instructions to Personnel*. Assigned to A. Shapiro with instructions to collaborate with E. S. Pardoe and Adrian Hughes, Jr. This assignment includes the revision of the bus operating rules prepared in 1924 and revised in 1926, together with the preparation of instructions to personnel. The inspection rules prepared by the 1926 equipment committee of the Engineering Association are to be reviewed.

Subject No. 2—*Equipment*. This is to be a study of sizes and types and their application to various classes of service including equipment used in chartered coach service. The assignment was made to B. W. Arnold with instruction to collaborate with D. L. Fennell, Thomas Noonan, D. A. Scanlon, J. L. Smith and R. H. Pinkley.

Subject No. 3—*Fares and Methods of Fare Collection*. Assigned to E. D. Dreyfus with instructions to collaborate with D. A. Scanlon.

Subject No. 4—*Methods, Practices and Economics*. This study to include chartered coach and bus operation, package and express business (including mail), and cost analyses of operation.

It was agreed that the data for this year's report are to be obtained from a group of fifty predetermined companies which are to be divided among various members of the committee for the collection of data.

Those present at the meeting included the following: Sponsors Paul E. Wilson and A. R. Myers, Chairman R. N. Graham, Vice-Chairman B. W. Arnold, C. H. Chapman, E. D. Dreyfus, J. L. Smith (representing D. W. Harvey), Adrian Hughes, Jr., Thomas Noonan, E. S. Pardoe, H. B. Whitman (representing A. T. Warner).

The News of the Industry

7 Per Cent Return Allowed

United States Supreme Court Fixes "Spot" Reproduction Cost — The Decision May Affect Tractions

The United States Supreme Court on Nov. 22 virtually held that a public utility corporation was entitled to charge rates which would permit it to earn 7 per cent on its "spot reproduction value." With Justice Brandeis dissenting, chiefly because of the difficulties of determining what the "spot reproduction value" is, the court handed down an opinion upholding an injunction restraining the Public Service Commission of Indiana from ordering a reduction of the Indianapolis Water Company rates. The injunction, issued by Federal District Judge Geiger, was based on his finding that the valuation of the company's property was too low and the rates proposed confiscatory.

In fixing the value of the water company's property the Public Service Commission arrived at a total of \$16,455,000, including among the items cost of reproduction, less depreciation, on the basis of average level of labor and material prices for a ten-year period, including also material and supplies, capital additions, going value and water rights and existing working cash capital.

In its opinion, upholding the lower court, the majority of the court held that the "spot" reproduction cost of the property is "a fair measure of the value of the physical elements of the property" and "a reasonable rate of return is not less than 7 per cent."

Judge Geiger in his injunction writ accepted the arguments of various experts that the reproduction value of the company's property was approximately \$17,000,000 and affirmed the addition to the value of the physical property items covering water rights, going value and cash working capital, bringing the total to approximately \$19,000,000. The Supreme Court said:

It is true that if the tendency or trend of prices is not definitely upward or downward and it does not appear probable that there will be a substantial change of prices, then the present value of land plus the present cost of construction of plant, less depreciation, if any, is a fair measure of the value of the physical elements of the property. The validity of the rates in questions depends on property value Jan. 1, 1924, and for a reasonable time following.

And we are satisfied that the decree is right. A reasonable rate of return is not less than 7 per cent. In his decision the district judge plainly intimated that he was of the opinion that probable net earnings for 1924 were not sufficient to pay more than 5 per cent on \$19,000,000. The amount of net earnings in 1924, as estimated by appellants, is only sufficient to pay 7 per cent on \$16,022,145. The evidence requires the finding that, exclusive of items classified as non-operative, the value is much more than that amount.

Justice Brandeis, dissenting from the opinion of his colleagues, declared that "spot" reproduction would be impos-

sible of accomplishment without the aid of Aladdin's lamp." He held that any estimate of a "spot" reproduction would be delusive if based on "spot" prices of labor, materials and money where the plant had required years for completion.

The case was argued before the Supreme Court last April. A decision had been eagerly awaited, because the issues of law closely paralleled most of

those involved in the other rate cases, notably that of the Consolidated Gas Company, New York, argued before the Supreme Court Oct. 18 and 19. Moreover, the Indianapolis case had been argued for the company by ex-Justice William L. Ransom of New York City, who was one of the counsel who argued before the Supreme Court the similar issues in the New York gas rate cases.

Politics Blamed by Mr. Insull

Draws Deadly Parallel Between Railways and Other Utilities to Show How Refinancing Has Been Blocked—Investment of New Money in Tractions Almost Nil

RESPONSIBILITY for the failure of transportation companies in Chicago to obtain adequate funds for refinancing, extensions or improvements was placed squarely on local politics on Nov. 18 by Samuel Insull in an address before the Electric Association of Chicago.

Mr. Insull declared that the electric industry in Chicago required \$137,500,000 in new capital in the year ended June 30, 1926, of which \$82,000,000 was for electric supply companies, \$21,000,000 for telephone and telegraph companies, \$20,000,000 for manufacturers and only \$14,000,000, or less than 10 per cent of the total, for electric railways, although their total investment in the district is larger by \$50,000,000 than that of any other group of electrical enterprises.

Mr. Insull said these figures suggested a momentary digression from the topic

of his principal theme. The capital investment of the electricity supply companies in the Chicago district has been practically doubled in ten years; that of the telephone and telegraph companies a little more than doubled. The investment in electrical manufacturing is now probably about six times that of ten years ago.

During the same ten years the investment in the electric transportation of the district has been increased less than 10 per cent, and the preponderant portion of this has gone into suburban lines and the elevated lines of Chicago.

Mr. Insull said there must be a reason for this small increase in the electric railway investment. No public utility service is developed and extended without new capital investment. The need of increased public utility facilities here has not been confined to the electricity supply and telephone services. Surely there has been need of transportation development somewhat in proportion to other development. Why has it not come?

According to Mr. Insull, the correct answer is unmistakable. He said:

Electric transportation has been the football of local politics. The electricity supply and telephone services have been under strict regulation, but have been comparatively free from local harassment. They have, therefore, been able to look ahead and to work out consistent and comprehensive development plans and put them into effect.

The seat of obstruction to transportation development is revealed the more clearly when you recall that the preponderant portion of what little new capital has been put into transportation development has been applied to those transportation agencies which are least affected by local politics, namely, the suburban electric and the elevated lines.

The local transportation business here is afflicted with a lot of economic absurdities as well as political agitation. Just think of making a fixed investment under a franchise grant that is subject to termination at the end of a few years, without making any provision in rates or otherwise for amortization of the investment. That is an economic absurdity.

The transportation business in Chicago, apart from the elevated and suburban lines is run on the theory that you can pick up all of the property used in it after a few years—that is, at the end of the franchise term—and carry it away, with its value and usefulness unimpaired. But the rates for

The local transportation business in Chicago is afflicted with a lot of economic absurdities as well as political agitation. Just think of making a fixed investment under a franchise grant that is subject to termination at the end of a few years, without making any provision in rates or otherwise for amortization of the investment! That is an economic absurdity.

I mention this because the correction of it is in part your problem as citizens of Chicago. Men of your character—men of activity and standing in the community—must take hold of this situation and give it serious attention if it is to be corrected before the city is harmed beyond repair.—SAMUEL INSULL.

service are based on the assumption of a continual right to use the streets for all time.

I mention this absurdity because the correction of it is in part your problem as citizens of Chicago. Men of your character—men of activity and standing in the community—must take hold of this situation and give it serious attention if it is to be corrected before the city is harmed beyond repair.

In the belief that it would serve to stave off a receivership, Mayor William E. Dever on Nov. 23 brought forward a proposal to extend the franchise of the Chicago Surface Lines for six months after their expiration next February. As a result of the Mayor's proposal, a resolution was presented to the City Council directing the transportation committee to consider the matter at once.

No Early Vote in Kansas City

The referendum petitions calling for a general vote of the public in the matter of the twelve-year extension of the local railway franchise, at Kansas City, Mo., were filed with the city clerk on Nov. 13. The petitions contained 13,213 signatures. The law required that 10 per cent of the last mayoralty vote, or 11,460 signatures, be appended to the petition to assure a referendum vote. The petition demanded that the Council call a special election, but such a procedure would entail a two-thirds vote of the City Council. The expense of the election would be borne by the Kansas City Public Service Company. Some of these facts were brought out in an item in the *ELECTRIC RAILWAY JOURNAL* for Nov. 20.

At the same time, minority leaders of the Council are said to have stated they would not seek an early vote in the matter pending the outcome of the current hearing which the special council committee and the Kansas City Public Service Company are holding in an effort to draft a new franchise for the railway.

No city election is to be held until April, 1930, and no general election until November, 1928. This fact would apparently assure the validity of the recently voted extension of the old franchise until such time as present negotiations for a new franchise are completed, nullifying the need for any referendum vote in the matter.

On Nov. 15 Judge McElroy ordered a check of the 13,213 names on the petition. Should the investigation disclose that not enough names, legally signed, appear on the petition, the bill providing for a twelve-year extension of the old franchise would become a law.

Seattle Contemplates Free Rides

Shoppers of Seattle, Wash., may soon enjoy free rides downtown on the Seattle Municipal Street Railway on week-day forenoons, except Saturday. A plan whereby a group of merchants will pay the street railway a lump sum daily for use of the cars during certain forenoon hours is being worked out by Grant A. Stevens, market master at the Pike Place Public Market. In a communication to the City Council, Clark R. Jackson, superintendent of public utilities, expressed the opinion that the plan would materially increase street railway revenues during off-peak hours.

Fare Case at St. Louis Closed

Missouri Commission Takes Under Advisement Plea of United Railways, Now in Receivership, to Advance Fares at Once—City a Protestant

FINAL testimony was taken on Nov. 17 by the Missouri Public Service Commission at Jefferson City, Mo., on the application of Receiver Rolla Wells of the United Railways, St. Louis, for an immediate temporary increase in fares. Neither the city nor the company will file briefs, but the matter has been left open for ten days to give the St. Louis County municipalities an opportunity to file briefs if they so desire. An order on the application probably will not issue for several weeks.

In its original application for an increase filed last June the company asked the rate on adult fares be raised from 7 cents to 8 cents or two tokens for 15 cents. Action on that was suspended pending an audit of the company's books demanded by city officials.

City Counselor Muench of St. Louis contended that the city riders should not be compelled to make up losses sustained by the company on St. Louis county business, and that greater economy could be effected by the company in its operating departments, especially the claim department. He also said that the fixed charges for depreciation reserve are too high.

At the session on Nov. 16 Col. Albert T. Perkins, general manager for Receiver Rolla Wells, testified that the company is earning less than a reasonable return upon the valuation of \$51,781,348 fixed by the commission as of Jan. 1, 1919, without considering \$5,014,443 spent for additions and betterments since that time. He testified that the gross income of \$2,685,246 available for return in 1925 offered only 5.19 per cent return and that the income to Sept. 30, 1926, would give only a 5.26 per cent return.

BLAME FIXED FOR FALLING OFF IN BUSINESS

Col. Perkins blamed the competition of independently operated bus lines and private automobiles and service cars for the falling off in revenue, explaining that in October receipts were \$30,000 behind the similar month last year. He declared that the gross income of \$2,156,599 for 1926 up to Oct. 31 failed by \$90,523 to pay interest, fixed charges and miscellaneous deductions included in the amount allowed for return. He brought out that great reductions in operating costs have been effected since the receivership.

Chairman Brown of the commission interrupted Col. Perkins to ask whether he thought the receivership was cheaper than private management. Col. Perkins replied that he believed it was in many ways, under this particular receivership, but that it was not true of all receiverships of property. He presented an exhibit to show that if the 8-cent base fare or two tokens for 15 cents is granted the revenues of the company would be increased \$1,381,792 a year based upon the present traffic.

Gross revenue for the year ended Sept. 30, last, was \$18,623,643, averaging 6.9 cents per passenger. The pro-

posed fare would produce \$20,005,435 a year, it was estimated. The average fare, considering the straight fare, tokens and 3-cents child fare, would be 7.41 cents.

City Counselor Muench sought to show that the St. Louis Public Service Company, which proposes to take over the system when it emerges from receivership, was connected with the application of Receiver Wells for higher fares. Col. Perkins declared that the new company had no direct connection with the application but had raised no objections to it. He admitted that the company had an indirect interest in the proceedings in the event that it takes over the electric railways because of the effect of a fare increase on the revenues of the properties. Receiver Wells would do anything he could to expedite the work of reorganization.

Among other things the city charged that lack of managerial foresight and failure to make extensions, which provided a fertile field for bus competition, cannot now be fairly placed on the car riders, who should not be expected to free the company from the consequences of its inefficiency.

Salt Lake & Utah Transcontinental Status

The Interstate Commerce Commission at Washington, D. C., will reopen on Dec. 3 the transcontinental rate case of the Salt Lake & Utah Railroad, Salt Lake City, Utah, for argument. The case involves the right of the local line to participate in transcontinental freight traffic, both east and westbound, a matter which is said to be of vital importance to the railroad.

Upon application of the Union Pacific system in 1924 to eliminate the Salt Lake & Utah Railroad from participation in the westbound business in connection with its lines, division three of the Interstate Commerce Commission decided against the Orem road.

The present action of the commission in reopening the case results from the petition filed by the receivers immediately after the handing down of the last-named decision. The denial of the freight agreement privilege to the Salt Lake & Utah was referred to in the *ELECTRIC RAILWAY JOURNAL* issue for Sept. 18, 1926, page 470.

One-Man Operation on Albany-Hudson Line

Public Service Commissioner Lunn recently heard the petition of the Eastern New York Utilities Company for the consent of the commission to the operation of one-man cars on the entire railroad line of the company, which operates between Albany and Hudson, N. Y. Testimony was offered by the railroad to show that even though certain economies of management and operation had been introduced, it was still conducting its railway line at a loss and after certain investigations of other

lines of a similar character, it was felt that with the use of one-man cars, this deficit could be overcome. The company proposes to use a new standard type light-weight car with up-to-date electric track break equipment, "dead man's buttons" and other modern safety devices in place of its present heavy type cars. The city of Hudson has recently consented to the operation of buses by this company in place of trolley cars and these one-man cars are to be used on the suburban lines and to the terminals in Albany and Hudson. There was no opposition to the petition.

No Successor Named to Mr. Wallace

No successor has as yet been appointed to H. U. Wallace, whose resignation as general manager of the Department of Street Railways, Detroit, Mich., was referred to in the *ELECTRIC RAILWAY JOURNAL*, issue of Nov. 20, page 949. Mr. Wallace's resignation was accepted at a meeting of the Street Railway Commission held on Nov. 23, and a resolution adopted expressing to Mr. Wallace the commission's appreciation of the valuable services rendered by him to the Department of Street Railways and its regret that he should find it necessary to relinquish his position.

Facts on Los Angeles Situation Laid Bare

In its application for a new rate structure, referred to in the *ELECTRIC RAILWAY JOURNAL*, issue of Nov. 20, page 940, the Los Angeles Railway, Los Angeles, Cal., states that it is giving the city the best possible transportation service at or below the lowest possible cost, and that it is its intention to continue the finest possible service in the future. H. E. Huntington, the principal owner in the company, had always made it his policy to put back into the property the earnings of the system. The necessity for increased service, particularly the extension of bus lines, had resulted in a steady increase in operating costs and this increase had gone forward faster than the increase in traffic.

The company states that it is now faced with additional capital expenditures of more than \$6,000,000 during the next three years, and with additional increased operating costs, resulting from such capital increases, the taxes of the company were also increasing, amounting to \$850,000 in 1925. The company is seeking to establish a rate structure based on the 7-cent single fare with four tickets or tokens for 25 cents, including free transfer.

The petition refers to the value of its railway used in the service of the public, which is at the lowest estimate \$45,000,000, and that under the rates asked the company would earn, after operating expenses, less than 7 per cent on the value of its property. The company is asking the commission, the city of Los Angeles and the other communities to co-operate so the commission may arrive at an early decision.

George J. Kuhrtz, the general manager of the company, stated that the railway was alive to the importance of providing an adequate railway trans-

portation system and that the inability to give such a service under the present 5-cent fare was one of the principal reasons for making the application. An increase in fare, such as had been in effect in all other large cities in the United States, would have been

justified to the Los Angeles Railway several years ago, and it was only because of the unusual policy pursued by Mr. Huntington that the city of Los Angeles has been able to enjoy the benefit of this exceptionally low fare.

New Transit Plan Advanced in New York

Pooling of Present and New Subways Proposed Under Plan Suggested by Transit Commissioner Delaney—Adequate Return Admitted Necessary with City Participation in Private Company

JOHAN H. DELANEY, chairman of the Board of Transportation of New York, speaking with authority for the Mayor, made public on Nov. 24 the outstanding features of a reorganization scheme for transit which is still in the formative stage.

Chairman Delaney would create a quasi-public corporation, with earnings limited probably to 6 per cent, to take over not only the existing subways but also the new system now under construction. On the board of directors of the new corporation the city and the private transit interests would be represented, with the city maintaining at least 50 per cent control. The financing scheme would involve a gradual amortization of the private interests so that at the end of perhaps 40 years the public corporation, with the private interests eliminated, would have complete ownership of the properties.

This reorganization would involve the ditching of the dual contracts, so called, under which the subways are now operated, and the making of new contracts in which the 5-cent fare, according to Chairman Delaney, would not be a primary consideration.

The administration has firmly in mind the fact that the new subways are being constructed at a cost greatly in excess of the cost of the existing lines. It also has in mind the fact that the municipal subways, under the terms of the law permitting the city to borrow money for their construction, must be self-sustaining. This situation seemingly makes a continuance of the 5-cent fare on the new subways impossible.

But, says Chairman Delaney, the question of whether or not the 5-cent fare can be continued depends entirely on the method of financing, and he is by no means willing to admit that under the proposed reorganization scheme the fare will necessarily be raised. So far as possible he would refrain from borrowing to pay the cost of construction. The new subway will increase the value of the property along the route and consequently should greatly increase assessments. The increased revenues in realty created by the new subway, he argues, will reduce the amount of money which the city must borrow and on which it must pay interest. On the matter of finance he said:

The manner in which the city finances the subways will determine what the rate of fare will be. The Board of Transportation declared in May, 1924, that under municipal operation the fare would be 8 to 10 cents unless the subways were financed in a manner to reduce the burden of interest on the 50-year bonds. The present cost of operating the existing subways is 3 cents a passenger. The present cost of interest on the money is 3 cents a passenger. It is not fair to the rider to charge him 3 cents for his ride and 5 to 7

cents additional as the cost of an extravagant financial policy.

The question therefore of whether the 5-cent fare can be continued after the unification of the system and the formation of the quasi-public corporation will depend upon the ability of the roads to earn the proposed maximum of 6 per cent. If the roads can not do so it will be necessary to increase the fare to a point at which they can.

He said further:

The prospects of a 5-cent fare are better under this scheme than they would be under municipal operation. The existing contracts under which the old subways are operated provide for a 5-cent fare. They will endure for 40 years. But the law provides that the new subway must pay for the cost of operation and interest on the borrowed money and of amortization.

There is no hope of maintaining a reasonably low fare on the new subways, supporters of the administration declare, unless the old subways and the new subways are in some way pooled. To pool them the dual contracts must be abrogated and new contracts entered into with the transit companies. That is what the proposed reorganization is largely about. Mr. Delaney said:

I believe the people will approve the right kind of reorganization that will make the subway self-sustaining, protect the city and the private investors, eliminate any profits over 6 per cent on private capital, and will insure that the city will control, that service will be increased and that new subways will be constructed as fast as the plans are prepared.

The reorganization plan was conceived, Mr. Delaney said, during a conference between him, Dwight W. Morrow of the J. P. Morgan firm, James L. Quackenbush of the Interborough line and other officials of the transit lines, called to consider the financing of lengthening of station platforms. At this time it was suggested that the private investment in the transit corporations be evaluated in order to provide eventually for the retirement of the private securities and the formation of the quasi public corporation.

The B.-M. T corporation is "always ready to co-operate in full measure with the municipal authorities in any constructive movement for more subways and other rapid transit facilities; to bring about unification plans for improvement of transit conditions," according to that company.

On Nov. 25 Mr. Delaney was quoted to the effect that there was one error in the previous report. He was reported to have said that the quasi-public corporation should include surface trolley lines and buses, as well as all subway and elevated lines. That, he declared, was a misunderstanding. What he meant to say was that, while some persons thought such a consolidation ought to include street cars and buses, he was opposed to such inclusion.

Boston Bandits Must Die

The last hope of the young carhouse holdup men of escaping their sentences of electrocution for the murder of James H. Ferneau during the Waltham carhouse holdup was lost on Nov. 10 by a decision from the full bench of the Supreme Court. The court found there was no error in the denial of new trial and that the executive council of the Governor could not be forced to take action on a petition for respite of sentences. John J. Levereaux, John J. McLaughlin and Edward J. Heinlein were convicted of murdering the aged watchman after robbing the carhouse of \$1,300.

How Much Does Your Automobile Cost You?

An automobile expense card with 31 rulings for daily total expenditures has been printed by the Beaver Valley Traction Company, New Brighton, Pa. The speedometer readings for the first day, last day and total mileage for the month are to be noted at the top of the card. For the information of the owner, he is told that liability, fire, theft and collision insurance cost should be listed monthly at $\frac{1}{4}$ of insurance cost; finance charges should be listed monthly at $\frac{1}{4}$ of cost; depreciation should be listed monthly at $\frac{1}{36}$ of price paid. The card is so ruled that at a glance one can see the expenses for tires, gas, oil, parts, labor, tubes, parking and washing. In size, 9x4 in., the card can be hung conveniently by means of the cord attached. A year's supply of these cards will be furnished upon request and should prove of great value to an owner who is interested in seeing just how much of his income goes to the upkeep of his automobile.

Tokens in Indianapolis

Metal tokens will replace tickets on the Indianapolis Street Railway, Indianapolis, Ind., early in January. The company has signed a contract for 370 registering fare boxes and 1,000,000 of the metal tokens to put the new system into effect. The boxes will be placed on the rear platforms of the two-man cars and at the front door of the one-man cars. The metal disk adopted for Indianapolis has a design of the Soldiers' and Sailors' Monument, with the large letter I on one side and the name of the company and a facsimile of President Todd's signature on the other. Conductors will sell the tokens on the cars as tickets now are sold.

"Open House" Week in Milwaukee

Through the medium of "open-house week," the Milwaukee Electric Railway & Light Company, Milwaukee, Wis., showed its patrons how its electric and transportation services are supplied. During the week of Nov. 8 to 13 more than 65,000 people inspected the seventeen different operating properties of the company. There was a central exhibit consisting of all manner of electric power and railway equipment, from insulators to street cars, showing how the company has kept pace with the rapid development of both industries.

An added feature of the show was the daily exhibition of the five-reel movie entitled "Where Jimmie Works," a romance of the transportation business filmed on the company's properties.

New High Record for Chicago Surface Lines

The steady increase in riding on the Chicago Surface Lines during the year reached a climax in October with more rides than during any previous month in the history of the system. Total rides for the month were 135,878,579, an increase of 3,363,261 over the corresponding month last year.

The highest previous month in the history of the system was December, 1925. The October figures exceeded this by 2,929,063. As the peak of the year always comes in December, due to Christmas riding, Surface Lines officials are anticipating a phenomenal business during the coming December.

During December a year ago 99.8 per cent of all equipment—all but seven cars—was in daily service. One hundred new cars have been added to the service since that time and the maintenance schedule has been so arranged as to provide for the use of practically all cars during the coming season.

New Public Service Department in New York Jan. 1

In preparation for the consolidation of state departments, which goes into effect in New York on Jan. 1, the legislative budget committee has started a series of meetings and the legislative reorganization commission will meet soon.

A new Public Service Department is created to be headed by the chairman of the present Public Service Commission. It is to take over the public service and transit commissions.

Atlanta Company Scores Free Rides

A cessation of the free ride is urged by the Georgia Railway & Power Company, Atlanta, Ga., in its publication, *Two Bells*, as follows:

When you come driving to town in the morning in your automobile you see little groups of people congregated at street intersections where are located car stop signs. They aren't gathered there by accident. You know they are waiting for the street car. You pick up one or two or maybe three of them. You do it, of course, in a friendly spirit. You aren't deliberately trying to take 7, 14 or 21 cents away from the railway, or to save that money for the people you pick up.

Yet when you do this friendly act you unconsciously harm not only the railway, but the riders themselves. You take away from the company the only thing that it has to sell. The railway hasn't anything to sell but street car rides. When these rides aren't bought the revenue decreases, and as a consequence the railway suffers. Unless its rides are bought it cannot continue to build more lines, buy more cars and operate them more rapidly. The rides you present to persons waiting for the street car mean little or nothing to them. They do not count the 7 cents saved and the chances are that they get to the office ahead of their schedule because they planned their arrival by the street car.

It may be a friendly act on your part to pick up persons waiting for the street car. But it is also an act of unfair competition with the railway.

A New Visitor Appears in Westchester

There's a new face at the door in Westchester County, New York, in the person of "Aunt J. Walker," the foreboding policewoman whose warnings to "jaywalkers" are well known in New York City. Her visit was ushered in on announcement cards which appeared Nov. 10 on the highways and byways, in shop windows and on street corners.

It is because the records of Westchester County show that its proportion of deaths and injuries resulting from street accidents is far greater than that of either the State of New York or the entire United States that Barron Collier, president of Barron G. Collier, Inc., was urged to accept the chairmanship of the Westchester Public Safety Bureau. Col. Carl F. Hartmann, the Public Safety Bureau Director, will assist in the crusade for saving human lives. His efforts will be spent in educating the people in the matter of individual personal safety. Four specific groups will be concentrated upon, namely, the pedestrian, the automobilist, the parent and the child. According to his plan, the mayors, the chiefs of police and the superintendents and teachers in public and parochial schools will have active constructive parts in Westchester's safety campaign.

"Aunt J. Walker" was created by Barron Collier at the time he served as organizer and director of the Bureau of Public Safety of the New York Police Department. In that campaign, through her constructive criticisms and her cautions, a decided drop was noted in the number of street accidents in New York City.

Would Link City and Interurban System in Cincinnati

Entrance to the heart of Cincinnati, Ohio, with its interurban cars through utilization of the rapid transit loop is sought by the Cincinnati, Hamilton & Dayton Traction Company in an application which has been filed with the City Council. Samuel I. Lipp, attorney for the interurban company, who filed the application, explained that his company was co-operating with the Cincinnati Street Railway in the matter of third rails on Hamilton Avenue and that he could see no reason why the same spirit could not be extended to the use of the subway. The Cincinnati terminal of the interurban company is located on Spring Grove Avenue, about 6 miles from the heart of the city. The equipment of the interurban company is of standard gage and would link up with that operated by the Cincinnati Street Railway. Mr. Lipp said that he felt confident his company could reach an agreement with the Cincinnati Street Railway for utilization of the subway from Cumminsville to the heart of Cincinnati, because it was anticipated that the latter company would be lessee of the rapid transit system when completed. The application of the Cincinnati, Hamilton & Dayton Traction Company has been referred to the transportation committee of the Council for consideration.

News Notes

Eighth Route for One-Man Cars Opened.—One-man car service was introduced on another line in Milwaukee, Wis., on Nov. 14 by the Milwaukee Electric Railway & Light Company. This service was substituted on the Oakland-Delaware line, running through a densely populated residence section into the downtown section. Addition of this line marks the eighth route on which the company is now supplying one-man car service.

Dead Line on Track Repairs Set.—Unless the International Railway, Buffalo, N. Y., repairs pavement between its tracks on various streets in the city of Buffalo before Dec. 15, the City Council has threatened to revoke the company's franchise. The franchise in Grant Street from Forest Avenue to Military Road already has been revoked, but the company continues to operate cars on the line at a speed not in excess of 5 m.p.h. The ultimatum of the municipal authorities was served on the traction company when the International filed its equity action in United States District Court seeking to restrain the city and the New York Public Service Commission from interfering with the collection of the proposed new tariff of fares.

Date of One-Man Car Hearing Fixed.—The Ontario Railway and Municipal Board has fixed Dec. 13 as the date on which it will hear the city's application for an investigation of the one-man car as operated on the lines of the Toronto Municipal Railway. The application is the result of a resolution presented by Comptroller MacGregor and passed by the Board of Control.

Popular Cars Put Back on Line.—The Monongahela West Penn Public Service Company has re-established its local interurbans between Fairmont and Clarksburg, W. Va., following a request made to Manager R. W. Spofford. When the limited runs made by the "West Virginia" were started it was the general opinion that there would be little demand for the half-hour cars that operated from Fairmont at practically the same time as the limited. However, it was soon realized that patrons were being inconvenienced, especially students and teachers.

Resolution Condemns One-Man Cars.—A movement to abolish the one-man street cars now being installed by the Georgia Railway & Power Company has just been launched by the Fifth Ward Civic League, which has passed a resolution condemning the present one-man system. In addition to the resolution the league is preparing and will circulate petitions throughout the ward to be signed by leading citizens and presented to the Public Service Commission in the near future. It is charged in the resolution and in the petitions to be circulated that the one-man street cars are "inefficient and dangerous to traffic." Practically all of the new cars secured by the company are of the one-man type.

New Line Opened.—The Miami Beach Railway, Miami Beach, Fla., has opened up its newest railway extension, the North West Seventh Avenue lines, with operation from Fifth Street to 38th Street. The extension was completed some time ago but paving and other operations had to be completed before service could be started. The original plan of the city was to run the line only as far as 36th Street, but petitions by property owners brought a two-block extension. The extension will serve a heavily populated section of the city.

Dr. Hyland on the Mend.—Dr. Robert F. Hyland, chief surgeon in charge of the medical department, Employees' Mutual Benefit Association, United Railways, St. Louis, Mo., broke his right leg recently when he was run down and hit by a taxicab. He has been confined in St. John's Hospital for some time, but it is expected he will be back at his desk soon.

Would Reduce Children's Tickets.—The Santa Barbara & Suburban Railway, Santa Barbara, Cal., has applied to the Railroad Commission for authority to place in effect reduced school children's commutation tickets of 40 rides for \$2, applicable to children up to eighteen years of age. The present tickets call for 40 rides for \$1, applicable to school children up to twelve years of age.

Short Subway for Pittsburgh.—The Council of Pittsburgh has affirmed an ordinance authorizing a subway intended for street cars under Fifth Avenue and Sixth Street from Chatham Street to Duquesne Way. The ordinance was sponsored by the City Transit Commission. It is designed to effect the first step in a proposal pending since 1919 when the people authorized \$6,000,000 for a subway in the First and Second Wards. There would be two stations connected with the proposed subway, one running from William Penn Place to Wylie Avenue and the other running from Liberty Avenue to Penn Avenue. The Pittsburgh Railways would presumably operate its cars in the subway.

Council Against One-Man Cars in Montreal.—By a unanimous vote the City Council of Montreal, Que., has registered its opposition to the use of the one-man car in Montreal. An amendment that action on the motion be deferred for a while, so as to give the Montreal Tramways further opportunity of testing the utility of these cars, was defeated by a vote of 27 to 6, after which the main motion was accepted without opposition. Among the arguments set forth in support of the motion was that a car in Montreal should be supplied with a conductor, not only for the collection of tickets, but also to aid, when necessary, women and children to enter and alight.

Discuss Operation at Round Table.—A weekly luncheon for officials and department heads of the Waterloo, Cedar Falls & Northern Railway, Waterloo, Iowa, has been started as a round-table discussion. Subjects will be submitted by department heads looking toward a more efficient and economical operation of cars and interurban trains. The conference plan was instituted by C. M. Cheney, president.

Foreign News

Delegation Returns to Berlin

A committee from Berlin which has been studying electric railway and bus operation in this country returned on the *Deutschland* on Nov. 10. The committee consisted of Dr. Friedrich Lademann, director of the Berlin Street Railways and Herman Amberg and Friedrich Lange, members of the advisory board of the transit system. In speaking of its plans before leaving New York Dr. Lademann said:

The committee was formed to study outstanding traffic problems in London, Paris and the American cities visited, particularly as they related to the operation of cars and buses. There has been some agitation by a city official in Berlin for the substitution of buses for street cars in the downtown section.

Our investigations here and abroad have convinced us that such a substitution is not feasible. The principal objections to it are that the cost of carrying passengers is higher on buses and the vehicles also occupy more street space a passenger than the surface car. In Berlin we seek both to make transportation service profitable and to conserve street space. There is no doubt that the surface car accomplishes these results better than the bus.

One feature of American operation which has impressed us greatly is the tremendous accident cost to which your transportation lines are subjected. We have found that some companies are paying as much as 10 per cent of their gross in accident claims. Our accident payments are much lower than this, due in part, no doubt, to the fact that we have fewer automobiles.

Service Speeded Up for Cricket Match.—Three hundred and ninety cars of the London County Council Tramways, with a seating capacity of 28,000, passed the cricket grounds in an hour's time during the final match held recently at Kensington Oval, London.

Tramway Pageant in Manchester.—Birth and growth of Manchester's Tramway Department was recently exemplified in the tramway pageant, a feature of the civic festival, which lasted for seven days during the early part of October. Nearly 1,000,000 passengers are carried each day on these cars. Models of the first electric car as contrasted with the type used now were demonstrated in the procession, which was led by an original one-horse car and followed by a three-horse bus and a motor bus.

Third Rail to Replace Trolley on Southern Railway System in England.—Gradual abolition of the overhead trolley and adoption of the third rail is occurring on the lines of the Southern Railway in England. Together with the extension of the electrification on 105 single track miles, this program will cost almost \$19,000,000. The annual number of train miles of the present service which will be affected is 4,416,529, of which 2,038,556 train miles is now steam operated and 2,377,973 train miles operated by overhead electric trolley. About 800 additional coaches will be needed, and these, too, will be converted from the old steam equipment. It is said that completion of the changes in the existing system will probably take until the latter part of 1928.

Recent Bus Developments

New South Side Bus Route in Chicago

As a result of a recent order from the Illinois Commerce Commission, in which a petition of the Chicago Motor Coach Company was sanctioned, a new bus service was started on South Park Avenue as far south as 79th Street, Chicago, on Nov. 21.

The new route will serve a portion of the city where transportation facilities have been inadequate for some time. The petition was filed at the instance of a number of south side civic organizations. These organizations are now urging the Chicago Plan Commission to recommend that South Park Avenue be widened to 200 ft. from 55th Street south to 130th Street.

Another Minneapolis Bus Line

The Twin City Rapid Transit Company, Minneapolis, Minn., will begin operation at once of an extra service bus line from the heart of the city out Nicollet, La Salle and Hennepin Avenues to 36th Street. This line is made possible for extension later by permit of the Park Board, which has decided to allow bus lines to utilize park highways under certain restrictions and license fees. The fare will be 10 cents and will serve a district off the car lines. The next move is to establish a bus line around Cedar Lake over parkways. The Hennepin Avenue line will utilize new gas-electric buses.

Commission Refuses to Reconsider Pasadena Matter

The Railroad Commission of California has denied petitions of the city of Pasadena for a rehearing of the application of the Pacific Electric Railway for an increase of fares on its motor coach lines in that city and of the Pacific Electric Railway to operate motor coach lines in Pasadena and the commission's investigation into the entire subject of motor coach operation in Pasadena.

Santa Cruz Operation Too Costly

The Union Traction Company, operating buses from Santa Cruz and Capitola, Santa Cruz and Twin Lakes and intermediate points, has applied to the California Railroad Commission for authority to assign its certificate for such operation to the Auto Transit Company, and the latter company has requested permission to operate the same. The Union Traction Company sets forth in its application that it has sustained a loss through the operation of said bus lines ever since it was authorized to operate them in lieu of certain street railway operations heretofore conducted; further, that the Auto Transit Company can operate the bus lines to much better advantage in connection with its present operations, extending from San Francisco to

Monterey, Hollister and Salinas by way of Santa Cruz and Watsonville. It has been agreed to retain the transfer privileges between Santa Cruz-Capitola and Santa Cruz-Twin Lakes lines, and the west side lines of the Union Traction Company shall as long as they are operated continue as heretofore, and the apportionment of fares shall be fixed by the Railroad Commission.

Independent May Operate

The Pennsylvania Public Service Commission has decided that John Collins, the holder of a certificate of public convenience to supply bus service, did not violate his contract as complained by the Lehigh Traction Company, Hazleton, Pa. Mr. Collins was granted a certificate to operate buses as a common carrier between the city of Hazleton and Mountain Scenery Hotel, Luzerne County, through the villages of Milnesville and Hollywood; from Mountain Scenery Hotel to Lattimer No. 2 and Scotch Hill; also between Hazleton House, in the city of Hazleton, and the State Hospital in said city. In May, 1924, a complaint was filed by the Lehigh Traction Company contending that when the respondent was authorized to operate he did not aver any intentions of supplying service to the villages through which he passed, and thereby had no such right. The commission decided that this construction of the certificate granted was entirely too narrow and not in accord with the general understanding of the language of the certificate. It ordered that the respondent was in no way violating the terms of his certificate and therefore refused the prayer of the complainant for revocation of his certificate or for a restraining order.

More Omaha Lines Opened

The Omaha & Council Bluffs Street Railway, Omaha, Neb., has put two more bus lines into service. The new routes are from 32d Avenue and Arbor Street west to 40th and Marinda and from 50th Street and Underwood Avenue to 52d and Franklin Streets. Fifteen-minute service is maintained. Other routes are from 24th and Kansas north, from 42d and Leavenworth to 45th and Center, from 36th and Q Street south on 36th to Harrison and from 33d and Parker west to 40th and Maple.

Developments in Seattle Bus Territory

Because of the growth of the bus business in the southwestern district of the Puget Sound Power & Light Company, Seattle, Wash., a new department has been set up to manage all motor coach transportation. This department is in charge of Col. M. D. Mills, with the title of general superintendent of motor transportation.

The new department will manage the

Park Auto Transportation Company, whose name has been changed to North Coast Transportation Company; the stages of the Puget Sound Electric Railway from Tacoma to Olympia, the City Transportation Company, which operates suburban service around Tacoma, and the Portland-Seattle Stage Company, which operates the through parlor car line from Seattle to Portland. These lines will be called the North Coast Lines.

A new terminal is being constructed at Auburn, arrangements have been made for a new terminal at Kent, improvements are being planned in terminal facilities in Tacoma, Olympia, Chehalis, Kelso and Longview. The plan is to have a considerable amount of new equipment on these runs early next year.

When the North Coast Transportation Company began operations in October it was desirable to have a trademark or emblem to be used on coaches, stationery and caps of motor coach operators. A contest was put on among all of the employees of the southwestern district for the best design for this purpose. More than 200 designs were submitted. The prize was a trip to Portland and \$25 in cash.

School Service Increased.—A second bus line to serve students in the Girls' High School, Atlanta, Ga., was put in operation on Nov. 1 by the Georgia Railway & Power Company. The service, which is similar to that put in operation at the opening of the school term between Morningside and the Girls' High School, is being installed to serve patrons in the west end section of the city. Double-deck coaches similar in structure and design to those used on the Morningside line have been installed. The line is being advertised by the company as the "New Beauty Special." This special bus service to and from Girls' High School has in a large measure overcome the difficulties encountered in the isolated location of this school.

Will Apply for Bus Permit.—The East St. Louis & Suburban Railway has filed notice with the Madison County Board of Supervisors at Edwardsville, Ill., that an application will be made to the Illinois Commerce Commission for a permit of convenience and necessity to operate a bus line between Glen Carbon and Edwardsville, Ill. Recently the railway company obtained an injunction which forced F. W. Herzog, Edwardsville, Ill., to suspend a bus line run by him for several years. Mr. Herzog operated without a state permit.

Bus Service Authorized in Binghamton.—The Public Service Commission on Nov. 16 granted the petition of the Binghamton Railway Bus Lines, Inc., Binghamton, N. Y., for a certificate permitting the operation of bus lines in that city. The Binghamton Railway Bus Lines, Inc., is a subsidiary company of the Birmingham Railway. The certificates cover the Seminary Avenue and Riverside Drive lines and are subject to the franchise by the city of Binghamton. The petition of the company looking forward to bus operation was referred to in the ELECTRIC RAILWAY JOURNAL, issue of Oct. 2, page 592.

Financial and Corporate

Massachusetts Deal Approved

Cities and Towns in Which Worcester and Springfield Lines Operate Consent to New Haven Control

The acquisition of the Worcester Consolidated Street Railway, Worcester, Mass., and the Springfield Street Railway, Springfield, Mass., has actually been accomplished by the New York, New Haven & Hartford Railroad. Three-quarters of the cities and towns served by the electric railways have approved the control by the New Haven to make it an established fact.

Senator George D. Chamberlain, representing the interests of the city of Springfield, has assured those interested that the voice of the city has not been taken away and despite the fact Springfield and Worcester did not approve the agreement entirely the Public Utilities Commission is pledged to protect their interests. The commission finds that the Worcester-Springfield opposition does not prevent the New Haven from taking over the ownership of the railways. As to its own jurisdiction in requiring the fulfillment of promises to Springfield and Worcester by the New Haven, it had no explanation to offer. The fact remains that enacted Legislation makes the two cities dependent on informal agreements in spite of the fact that 80-90 per cent of the railway business is carried on in Worcester and Springfield.

The bill as originally drawn provided for acceptance by the two principal cities. Changes were proposed by Governor Fuller and in two places, respectively, where the wording was: "The City Council of the city of Worcester" and "the City Council of the city of Springfield"; it was reworded to read "the City Councils of the cities and the selectmen of the towns in which the Worcester Consolidated (Springfield) Street Railway operates."

Clark V. Wood, president of the Worcester and Springfield companies, in reviewing the situation said:

Personally I am confident that none of our citizens need be disturbed over the New Haven's plan of taking control of the trolleys under Chapter 371 of the Acts and Resolves of 1926, as I am sure their interests will be properly safeguarded.

While it may be a fact that the acceptance of the act by three-fourths of the cities and towns in which the Springfield and Worcester systems operates would technically constitute authority for exercising the privilege of control, E. G. Buckland, vice-president of the New Haven Railroad, has stated positively, both in public and privately, that even though this condition exists, he would not act without the assent of Springfield and Worcester.

A statement from Mr. Buckland to Mr. Wood regarding the matter is worded as follows:

Above all things do away with any idea that, even if we should get the assents of the outside towns, we would endeavor to act under the law without the assents of Springfield and Worcester. We must start with the cordial help of the two cities, based upon the idea that only by working together can a railway system be made

satisfactory to the people and profitable to ourselves.

A letter is expected from Mr. Buckland to directors of the New Haven road in which all conditions of the ownership, which will include rehabilitation plans in Springfield and Worcester, will be set forth for approval. The contents of this missive will constitute a contract to the cities involved.

Letter to Chicago Bondholders

Bankers Warn Owners of Securities of Chicago Railways of Impending Traction Receivership

A definite assertion that the Chicago Surface Lines will be forced into receivership at the expiration of the franchises next February is made in a letter sent to the 10,000 first mortgage bondholders of the Chicago Railways by executives of seven large Loop banks, who compose the bondholders' protective committee.

The committee first intimated the probability of a foreclosure early last summer. It declares that foreclosure of the first mortgage will be necessary, and legal proceedings to that end may be started shortly after Feb. 1.

Heretofore it had been thought by the committee that the City Council might reach a settlement in time to forestall a receivership, but apparently the members of the committee now hold out faint hope for this and are preparing to go into the courts. It is stated:

We believe that none of the \$94,634,437 of outstanding Chicago Railways bonds will be paid at maturity. Prompt and united action by the holders of the first mortgage bonds is the only efficient means by which their rights can be protected. This requires organized action through a committee working in the interests of all the bondholders.

The letter also outlines the negotiations now pending with city officials for a new unified transportation ordinance and describes the various legislative enactments necessary to the adoption of such a franchise. It warns that no plan is practical, however, without the co-operation of the security holders and urges that all bonds be deposited with the committee at once.

Publication of the bankers' letter provoked much interest in City Council circles, where it was felt that the appointment of a receiver for the Surface Lines next February would mean the end of city control in local transportation matters. There seems to be no doubt in the minds of the Aldermen that the Illinois Commerce Commission will immediately issue a certificate of convenience and necessity that would permit the lines to continue operation despite the expiration of their franchises. With uninterrupted operation thus assured and relieved of the obligation to expend moneys for improvements and extensions, they believe that the Surface Lines would be in a position

to force the city to accept practically any compromise.

Members of the staff of the corporation counsel contended, however, that although extensive litigation might ensue, and in spite of the granting of a permit from the state commission, the constitutional provision that no street railway can be operated without the permission of the city would be ample protection for the city. This permission, granted in the 1907 ordinance, they point out, will expire on Jan. 31, 1927.

Warrant Basis in Seattle

The Seattle Municipal Street Railway, Seattle, Wash., will go on a warrant basis on Dec. 10 and the Seattle Clearing House Association has been asked to have its banks cash the warrants. The railway, the city comptroller's figures show, must make payments totaling \$1,150,865 by March 1. The principal items are an \$833,000 payment on the railway purchase bonds and \$275,875 interest on the balance due. The railway will be unable to make these payments without going on a warrant basis. In past instances where the line has gone on warrants the city has always been able to redeem its warrants.

Puget Sound Property Must Use Railway Fund

The United States Circuit Court of Appeals at San Francisco has rendered an opinion to the effect that the 1919 tax on the railway properties of Seattle, Wash., must be paid by the city, but cannot be collected from the general fund. In effect, this means that the Puget Sound Power & Light Company, which sold the city the railway system, must look to the city railway fund for payment of the major portion of the tax for the year when the transfer was made. The tax, with penalties and interest, amounts to \$545,370, and city officials are agreed that the city will pay this sum in railway utility warrants, as there are no funds available to make payment in cash. Corporation Counsel T. J. L. Kennedy characterized the decision as a "substantial victory" for the city on the ground that the court held payment could not be made from the city's general fund. He stated that the city will contest any appeal by the company.

United Railways to Dissolve

The directors of the United Railways Investment Company, New York, at a special meeting of stockholders called for Nov. 23, voted on a proposal to dissolve the company. United Railways Investment Company formerly was the holding organization which controlled Philadelphia Company and allied organizations, including Duquesne Light, but its holdings of common stock were subsequently acquired by the Pittsburgh Utilities Corporation.

Standard Gas & Electric Company having acquired control of United, an offer to minority shareholders of the latter was made, providing for the exchange of United for Standard Gas.

In excess of 97 per cent of the total outstanding common and preferred stock of the United Company has already been exchanged for Standard Gas stock. Practically the only source of income of United Railways this year has been dividends received on stock owned in Pittsburgh Utilities.

The United Railways directors have declared a dividend of 15 per cent on the preferred stock, payable on Nov. 22 to stock of record the same date.

Hears Abandonment Petitions for New York State

Public Service Commissioner George R. Lunn held three public hearings on Nov. 23 on applications of the United Traction Company for abandonment of certain portions of its lines in the cities of Albany and Rensselaer, N. Y. The first application asked for the approval of a declaration of abandonment of the South Ferry Street line from the corner of South Pearl Street to Broadway, Albany. This line has not been in use for several years, with the consent of the city.

The two other petitions related to the lines in the city of Rensselaer, one known as the Aiken Avenue line and the other the Third Street line. The former has not been operated since the substitution of bus service in 1924 by the Capitol City Transportation Company, Inc., whose buses are being operated over practically the same territory as the old car line.

Testimony was offered by the traction company to show that the Third Avenue line is being operated at a loss with street cars and that it is proposed

to substitute a bus line therefor with better results in earnings and service to be rendered and to abandon the use of the street railroad.

Norwich Property Sold

P. Leroy Harwood, a member of a bondholders' committee of the Groton & Stonington Traction Company, Norwich, Conn., on Nov. 22 purchased the Groton & Stonington Street Railway and all its accoutrements for \$50,000. He was acting as agent of the committee at an auction sale of the property. The sale followed a foreclosure action brought by the bondholders' committee, which secured a judgment in Superior Court. The Groton & Stonington Traction Company, which runs cars from the ferry line in Groton across the Thames River drawbridge to New London, practically controlled the Groton & Stonington Street Railway. The latter's line extended from the ferry line to Westerly. The status of both the Groton & Stonington Street Railway and the Groton & Stonington Traction Company was explained in the ELECTRIC RAILWAY JOURNAL, issue of March 13, 1926, page 464.

Charleston Properties to Pass to Southeastern

The merging of the companies controlling the railway, lighting and gas facilities at Charleston, S. C., was agreed upon at a meeting of the directors of the companies on Nov. 16. The four companies, merged into one, will be known as the South Carolina Power Company. The purpose is to clear the

way for the Southeastern Power & Light Company to take over the properties. A meeting of the stockholders of the four companies has been called for Dec. 17, when the sale of the properties will be ratified.

At the meeting on Nov. 16 Philip H. Gadsden, president of the four companies, resigned. Stuart Cooper was elected president of the Charleston Consolidated Railway & Light Company. B. A. Hagood was elected president of the three other companies. They are the Charleston Consolidated Railway, Gas & Electric Company, the Charleston Gas Light Company founded in 1846, and the Charleston-Edison Light & Power Company.

Preferred Claim by J. J. Heim Against Kaw Valley Disallowed

An end appears to have been put to the litigation between Harry C. Jobes, receiver of the Kansas City, Kaw Valley & Western Railway, Bonner Springs, Kan., and Joseph J. Heim. The action was brought against Mr. Heim to set aside a contract entered into between the company and him, under which \$224,000 of first mortgage bonds were delivered to Mr. Heim in exchange for \$212,000 of second mortgage bonds and \$47,565 of defaulted second mortgage interest coupons, and for the recovery of \$6,720 of interest paid to Mr. Heim on such first mortgage bonds.

In its decree the United States Circuit Court of Appeals sustained the finding of the lower court ordering Mr. Heim to return to the treasury of the company the \$224,000 in principal amount of the first mortgage bonds issued to him shortly before the appointment of a receiver for the company in 1924. A petition for rehearing has been denied, and the protective committee for the bonds announces that counsel for the defendant has signified that nothing further will be done, thus definitely settling the matter. With the return of the \$224,000 of bonds to the company treasury, the outstanding amount has been reduced to \$846,000, of which \$812,600 has been deposited with the bondholders' protective committee.

Holland Line Abandoned

Service on the Grand Rapids, Holland & Chicago Railway, a 43-mile line extending between Grand Rapids and Saugatuck, Mich., was abandoned on Nov. 15. The line, which constitutes the northwestern division of the Michigan Electric Railway, was in operation for the past quarter century. It is said that many residents in the vicinity are unable to believe that some measures will not be adopted looking toward its preservation. Heavy inroads by the motor truck and passenger bus into this once important artery in transportation have been partly responsible for the shutting down of the railway. One year ago the company established one-man car operation, but still the cost of service far exceeded the revenues.

The Consumers Power Company purchased the right-of-way of the line recently from the Heyman-Michael Company, Chicago, which obtained it at the foreclosure sale in federal court.

Conspectus of Indexes for November, 1926

Compiled for Publication in This Paper by
ALBERT S. RICHEY
Electric Railway Engineer, Worcester, Mass.

	Latest	Month Ago	Year Ago	Since War	
				High	Low
Street Railway					
Fares* 1913 = 4.84	Nov. 1926 7.42	Oct. 1926 7.40	Nov. 1925 7.30	Nov. 1926 7.42	May 1923 6.35
Electric Railway					
Materials* 1913 = 100	Nov. 1926 156.6	Oct. 1926 155.4	Nov. 1925 152.0	Sept. 1920 247.5	Oct. 1924 148.5
Electric Railway					
Wages* 1913 = 100	Nov. 1926 226.3	Oct. 1926 226.2	Nov. 1925 222.8	Sept. 1920 232	Mar. 1923 206.8
Am. Elec. Ry. Assn.					
Construction Cost (Elec. Ry.) 1913 = 100	Nov. 1926 203.7	Oct. 1926 202.9	Nov. 1925 202.4	July 1920 256.4	May 1922 167.4
Eng. News-Record					
Construction Cost (General) 1913 = 100	Nov. 1926 210.8	Oct. 1926 209.8	Nov. 1925 206.0	June 1920 273.8	Mar. 1922 162.0
U. S. Bur. Lab. Stat.					
Wholesale Commodities 1913 = 100	Oct. 1926 149.7	Sept. 1926 150.5	Oct. 1925 157.6	May 1920 246.7	Jan. 1922 138.3
Bradstreet					
Wholesale Commodities 1913 = 9.21	Nov. 1926 12.74	Oct. 1926 12.79	Nov. 1925 14.32	Feb. 1920 20.87	June 1921 10.42
U. S. Bur. Lab. Stat.					
Retail Food 1913 = 100	Oct. 1926 160.9	Sept. 1926 158.5	Oct. 1925 161.6	July 1920 219.2	Mar. 1922 138.7
Nat. Ind. Conf. Bd.					
Cost of Living 1914 = 100	Oct. 1926 267.2	Sept. 1926 266.8	Oct. 1925 269.7	July 1920 204.5	Aug. 1922 154.5
Steel Unfilled Orders (Million Tons) 1913 = 5.91	Oct. 31 1926 3.684	Sept. 30 1926 3.594	Oct. 31 1925 4.109	July 31 1920 11.118	July 31 1924 3.187
Bank Clearings Outside N. Y. City (Billions)	Oct. 1926 19.75	Sept. 1926 17.97	Oct. 1925 20.47	Oct. 1925 28.47	Feb. 1922 10.65
Business Failures Number	Oct. 1926 1428	Sept. 1926 1360	Oct. 1925 1407	Jan. 1924 2231	Aug. 1925 1353
Liabilities (Millions)	Oct. 1926 39.59	Sept. 1926 34.38	Oct. 1925 35.00	Jan. 1924 122.95	Aug. 1925 27.22

*The three index numbers marked with an asterisk are computed by Mr. Richey, as follows: Fares index is average street railway fare in all United States cities with a population of 50,000 or over except New York City, and weighted according to population. Street Railway Materials index is relative average price of materials (including fuel) used in street railway operation and maintenance, weighted according to average use of such materials. Wages index is relative average maximum hourly wage of motormen, conductors and operators on 137 of the largest street and interurban railways operated in the United States, weighted according to the number of such men employed on these roads.

Included in the foreclosure sale were ten passenger and four freight cars. The equipment, it is expected, will be sold piecemeal. The financial affairs of the company were reviewed in the issue of the *ELECTRIC RAILWAY JOURNAL* for Oct. 30, page 825.

Slight Gains Shown by Detroit Municipal Railway

The balance for October, 1926, reported by the Detroit Municipal Railway, Detroit, Mich., was \$48,663, compared with \$47,871 for the similar month in 1925. For the year ended Oct. 31, 1926, the balance was \$635,119, compared with \$548,227 for the year ended Oct. 31, 1925. The statement of earnings covering the periods mentioned is contained in the accompanying tabular presentation.

Tennessee Companies Protest Separate Valuation

The East Tennessee Electric Company and the Johnson City Traction Company recently filed a petition before the State Railroad and Public Utilities Commission protesting the commission's order of Sept. 23 which permitted an increase in Johnson City, Tenn., fares from 5 to 7 cents but also refused to consider the value of the companies as one unit.

The petition, called attention to the statement of the commission in the certiorari case pending in the Circuit Court of Davidson County in which it was stated that the combined value of the property had not been fixed: the two petitioners being separate and distinct corporations, the value of the Tennessee Eastern Electric Company

being \$2,500,000 and the value of the property of the Johnson City Traction company being \$225,000. Another statement says the value will be considered separately.

The attorneys said the company has not availed itself of the opportunity to increase rates because it feels that great injury has been done in the same order which refused to consider the value of the companies together.

Special Master Considers Denver & Interurban Case

When the case of the Denver & Interurban Railroad, electric subsidiary of the Colorado & Southern Railroad, came before Judge J. Foster Symes in the Federal District Court at Denver recently he appointed John H. Gabriel, a Denver attorney, special master in chancery to confer with William H. Edmunds, the receiver, and report his findings.

The road operates between Denver and Boulder and the court informed representatives of the intermediate cities that it would permit them to renew their pleas of intervention, but that none of the cities, with the exception of Boulder, had any contract with the company which guaranteed service to them by the railroad.

The Guaranty Trust Company, New York, trustee under the mortgage securing an issue of \$1,079,663 of first mortgage 6 per cent gold bonds, is seeking to foreclose that lien.

INCOME AND STATISTICAL STATEMENT OF THE DEPARTMENT OF STREET RAILWAYS, CITY OF DETROIT

Income	Month of October, 1926	Month of October, 1925	Year Ended Oct. 31, 1926	Year Ended Oct. 31, 1925
Operating Revenue:				
Railway operating revenue.....	\$1,849,526	\$1,977,316	\$22,936,219	\$21,983,553
Coach operating revenue.....	247,308	99,532	1,890,462	594,556
Total operating revenue.....	\$2,096,835	\$2,076,849	\$24,826,681	\$22,578,109
Non-operating income.....	24,084	19,018	261,436	180,418
Total revenue from all sources.....	\$2,120,919	\$2,095,867	\$25,088,118	\$22,758,528
Operating Expenses:				
Railway operating expenses.....	\$1,398,224	\$1,502,578	\$17,302,438	\$16,100,047
Coach operating expenses.....	225,656	93,971	1,852,673	577,149
Total operating expenses.....	\$1,623,881	\$1,596,549	\$19,155,112	\$16,677,196
Net revenue from all sources.....	\$497,038	\$499,318	\$5,933,005	\$6,081,331
Deduct:				
Taxes assignable to operation.....	\$62,888	\$58,213	\$715,545	\$708,944
Other deductions.....				935
Interest on funded debt:				
On purchase bonds.....	12,518	12,998	150,673	156,325
On construction bonds.....	66,745	66,745	785,875	785,875
On additions and betterments bonds.....	18,727	15,945	231,129	111,887
On purchase contract (D. U. R.).....	66,654	71,750	804,690	864,776
Total interest.....	\$164,645	\$167,439	\$1,977,367	\$1,918,364
Total deductions.....	\$227,533	\$225,652	\$2,687,913	\$2,628,243
Net income.....	\$269,505	\$273,665	\$3,245,092	\$3,453,087
Disposition of Net Income:				
Sinking Funds:				
For purchase bonds.....	\$11,295	\$11,295	\$133,000	\$133,000
For construction bonds.....	44,139	48,525	528,340	571,351
For additions and betterments bonds.....	13,589	14,155	161,114	412,990
For purchase contract (D. U. R.).....	151,816	151,816	1,787,518	1,787,518
Total sinking funds.....	\$220,841	\$225,793	\$2,609,972	\$2,904,859
Balance for the period.....	\$48,663	\$47,871	\$635,119	\$548,227
Statistics:				
Railway revenue car-miles.....	4,212,281	4,752,077	54,331,172	51,278,694
Coach revenue coach-miles.....	997,242	450,642	8,050,588	2,494,030
Railway revenue car-hours.....	424,384	506,737	5,660,527	5,544,026
Coach revenue coach-hours.....	96,528	47,126	806,030	260,814
Railway revenue passengers.....	29,345,502	31,658,874	365,691,174	350,529,071
Railway transfer passengers.....	10,260,133	10,858,997	127,343,566	120,773,485
Railway total passengers.....	39,605,635	42,517,871	493,034,740	471,302,556
Coach revenue passengers.....	2,749,754	1,217,449	22,526,916	7,844,683
Coach transfer passengers.....	239,964	72,074	1,742,702	189,125
Coach total passengers.....	2,989,718	1,289,523	24,269,618	8,033,808
Total revenue and transfer passengers.....	42,595,353	43,807,394	517,304,358	479,336,364
Railway operating revenue per car-mile, cents.....	43.90	41.61	42.22	42.85
Coach operating revenue per coach-mile, cents.....	24.80	22.08	23.48	23.84
Railway operating expenses per car-mile, cents.....	33.27	31.62	31.85	31.39
Coach operating expenses per coach-mile, cents.....	22.63	20.85	23.01	23.14
Railway operating revenue per car-hour.....	\$4.36	\$3.90	\$4.05	\$3.96
Coach operating revenue per coach-hour.....	\$2.56	\$2.11	\$2.35	\$2.28
Railway operating expenses per car-hour.....	\$3.29	\$2.97	\$3.05	\$2.90
Coach operating expenses per coach-hour.....	\$2.34	\$1.99	\$2.30	\$2.21
Ratio of transfer passengers to revenue passengers.....	34.96	34.30	34.82	34.45
Ratio of transfer passengers to revenue passengers.....	8.73	5.92	7.74	6.83
Ratio of coach passengers to revenue passengers.....	6.97	6.66	6.73	6.83
Railway revenue passengers per car-mile operated.....	2.43	2.29	2.34	2.36
Coach revenue passengers per coach-mile operated.....	9.40	8.95	9.07	9.19
Total railway passengers per car-mile operated.....	2.76	2.70	2.80	3.15
Coach transfer passengers per coach-mile operated.....	0.24	0.16	0.21	0.22
Total coach passengers per coach-mile operated.....	3.00	2.86	3.01	3.22
Ratio of railway operating expenses to railway operating revenue, per cent.....	75.60	75.99	75.44	73.24
Ratio of coach operating expenses to coach operating revenue, per cent.....	91.25	94.41	98.00	97.07

New Directors Elected.—Two new directors were elected at a recent meeting of the Key System Transit Company, Oakland, Cal. The new men are F. Bruce Maiden, Oakland real estate operator, and Herbert E. Clayburg of J. Barth & Company, bond house of San Francisco. Mr. Maiden replaces Joseph F. Carlston and Mr. Clayburg takes the place of Miles Standish.

Line Earns \$19,000.—The net earnings of the Municipal Railway of South Jacksonville, Fla., for the fiscal year 1925-1926 were \$19,000. An announcement to this effect was made recently by City Clerk Holsonback upon receipt of the report of September the final period of the year. The earnings for the year are nearly three times the total of the fiscal year previous. It is said that the success of the South Jacksonville project has led to the discussion of plans for its further extension and installation of a bus system.

Cincinnati Reports Surplus.—After deducting operating expenses and all fixed charges for the month of October, the Cincinnati Street Railway, Cincinnati, Ohio, accrued a surplus of \$6,987 in a report submitted to Edgar Dow Gilman, Director of Street Railroads and Motor Buses. The surplus for October with that for September, which amounted to \$6,093, will be allotted to the fare surplus fund. In a statement accompanying the report Mr. Draper said that the report for October would compare more favorably with that for September except for the fact that a further increase in the rate of pay of the company's employees became effective Oct. 1, thus adding \$10,-

000 to the operating expenses for the month. Losses from motor buses during October were \$13,913, which is approximately \$1,500 less than the loss in September. The loss would have been smaller were it not for an increase in pay to motor coach operators, effective on Oct. 1.

Would Abandon Service.—With operating expenses of its passenger department for the past two years \$2,000 in excess of revenues, the Chicago, Harvard & Geneva Lake Railway, operating for the past 28 years between Harvard, Ill., and Lake Geneva, Wis., has asked the Wisconsin Railroad Commission and Illinois Commerce Commission for permission to abandon service because of lack of patronage. Freight service, however, would be continued, according to the company's petition. The line extends 13 miles.

No Action on Brooklyn Proposal.—Action by the Brooklyn City Railroad, Brooklyn, N. Y., toward authorizing the changes in capital structure to which reference was made in the JOURNAL for Nov. 20 was put over until Dec. 7.

Messrs. Hadley, Winthrop and Fletcher on Engineers Board.—Dr. Arthur T. Hadley, president emeritus of Yale University; Beekman Winthrop, of Robert Winthrop & Company, and Andrew Fletcher, Jr., of W. & A. Fletcher Company, have been elected to the board of the Engineers' Public Service Company, thus filling the vacancy caused by the death of C. Chauncey Stillman and increasing the board's membership from thirteen to fifteen. This company was sponsored by Stone & Webster and controls among other properties the Virginia Electric & Power Company, Key West Electric Company, Eastern Texas Electric Company, El Paso Electric Company, Savannah Electric & Power Company, and the Baton Rouge Electric Company.

Service Ceases.—The Coal Belt Electric Railway, operating from Marion to Herrin and Cartersville, Ill., as a passenger and freight line, quit business at midnight on Nov. 15. The Illinois Commerce Commission had approved the cessation. The Coal Belt is a 14-mile line.

Greater Deficit on I. R. T.—For the three months ended Sept. 30, 1926, the total revenue from all sources of the Interborough Rapid Transit Company, New York, N. Y., was \$13,345,856, a decrease of \$875,675 over the corresponding period of last year. Expenditures for operating and maintaining the property increased \$540,507. Taxes payable to the city, state and the United States increased \$91,191.34. Rentals and other income deductions increased \$31,553. The net result for the three months was a deficit of \$2,212,658. This is \$1,538,928 greater than the deficit for the corresponding period of last year. The comparison with last year is influenced by the strike during the month of July of this year, as well as the fact that in July of last year there was a lump sum payment of \$770,000 on account of the new advertising contract, against which there was no similar payment this year.

Personal Items

J. F. Shaughnessy Heads Commissioners

Chairman of Nevada Body Elected at Asheville to Be the President of National Regulatory Body

John F. Shaughnessy, an active participant in the work of the National Association of Railroad and Utilities Commissioners and chairman of the committee on railway rates of that association from 1920 to 1924, was elected president of that body at the meeting in Asheville, N. C., Nov. 9-12. He was formerly first vice-president of the association and before that, at the meeting in Phoenix, Ariz., in 1924, was made second vice-president of that body.

Mr. Shaughnessy is chairman of the Public Service Commission of Nevada. He has been a strong proponent of state jurisdiction on the principle that it is beneficial to the utility to keep regulation close to the community



J. F. Shaughnessy

served. He appreciates the limitations imposed on busy operating officials and the difficulties encountered in considering state lines, but has consistently maintained that, in the formation of general policies, executives and attorneys of operating companies must consider the problems of the individual states served and must recognize state lines to the extent of so forming general policies as to take into consideration the interests and problems of the individual states served.

Mr. Shaughnessy was born in Oshkosh, Wis., in 1874. He attended public and high schools at Poynett, Wis. He entered railway service as brakeman on the Chicago, Milwaukee & St. Paul Railway on the La Crosse Division in 1891, continued as a brakeman in the train service 1½ years and then went to Santa Fé in train service between Chicago and Fort Madison, Iowa. In 1894 he left the Santa Fé to go to Fort Worth, Tex., with the Fort Worth &

Texas Railroad. There he served as brakeman, conductor, trainmaster and division superintendent, respectively. For a while he was responsible for construction work on his division, in charge of more than 450 miles of the railroad between Fort Worth and Texline. He continued in this capacity until 1903, when he went to the Southern Pacific as assistant superintendent on the division from Ogden, Utah, to Sparks, Nev. There he remained for three years. In March, 1907, he was appointed to be Public Service Commissioner of the state and since 1918 has served as chairman of that commission.

F. W. Funk Chief Electrical Engineer at Youngstown

Frank W. Funk has been appointed chief electrical engineer of the Pennsylvania-Ohio Electric Company, Youngstown, Ohio, to fill the vacancy caused by the resignation of George A. Her. The office now assumed by Mr. Funk is in addition to his duties as assistant to General Manager McCalla.

Mr. Funk became connected with the company at Youngstown as electrical engineer early in 1914 and continued in that capacity for three years, when he was appointed resident engineer for the Republic Engineers, Inc. Two years later, with C. I. Crippen, he formed the firm of Crippen & Funk, consulting engineers, and continued in that work till his return to Youngstown a year ago.

He was graduated from Ohio State University in 1908 and joined the engineering forces of the West Penn Power Company at Connellsville and later the development staff of the Westinghouse Electric & Manufacturing Company. After many interesting engineering jobs with Westinghouse, Mr. Funk in 1912 returned to the utility field as assistant electrical engineer of the Northern Ohio Traction & Light Company, where he participated in the design and construction of the Gorge power station. He continued with the N.O.T., as the Akron property is known, till he went to Youngstown in 1914.

Personnel of Puget Sound Bus Companies

Col. M. D. Mills has been placed in charge of the motor coach lines in the southwestern district affiliated with the Puget Sound Power & Light Company, Seattle, Wash., with the title of general superintendent of motor transportation. He had charge of motor transport work in the A. E. F. The new superintendent became connected with the Puget Sound companies in 1923. Since that time he has been with the Yellow Manufacturing Sales Corporation of Chicago.

The operation has been divided into two divisions—a southern division, in charge of H. R. Leigh, and a northern division, in charge of Joseph H. Lyons.

The maintenance of the stages will be operated by a third division of this department in charge of B. H. Steeg, who will be superintendent of equipment, with headquarters at Tacoma, and who will have charge of the shops and garages. Mr. Steeg is a newcomer, having previously been with the White and Yellow Coach Companies. William L. McCredie, formerly engineer for the Puget Sound Electric Railway and Tacoma Railway & Power Company, has been made assistant to the general superintendent of motor transportation.

Mr. Gadsden Withdraws from Charleston Company

Philip H. Gadsden has resigned as president of the Charleston Consolidated Railway & Lighting Company, Charleston, S. C., as part of a plan under which control of the company there will pass to the Southeastern Power & Light Company. Mr. Gadsden is vice-president of the United Gas Improvement Company and former president of the American Electric Railway Association. He was born at Charleston in 1867, was admitted to the bar in 1890 and practiced law in that city for more than fifteen years before he entered the public utility field. The United Gas Improvement Company, to the affairs of which Mr. Gadsden has lately been giving much of his time, was a large holder of stock of the company at Charleston.

L. F. Loree Awarded Holland Society Medal

L. F. Loree, president of the Delaware & Hudson Company, the United Traction Company, Albany, N. Y.; the Hudson Valley Railway, Glens Falls, N. Y.; the Troy & New England Railroad and a director and officer of many other corporations, is the recipient of the 1926 medal of the Holland Society of New York, awarded annually to the person who, in the estimation of the society, has done most to promote the welfare of mankind in his own particular field.

S. M. Cooper New Charleston Head

Stuart M. Cooper has been elected president of the Charleston Consolidated Railway & Lighting Company, Charleston, S. C., to succeed Philip H. Gadsden under a plan by which ownership of the property at Charleston will pass to the Southeastern Power & Light Company. He has been first vice-president at Charleston. Mr. Cooper was graduated from Syracuse University as an electrical engineer. Early in his professional career he served as assistant engineer of the Syracuse Lighting Company. Later he was in turn assistant construction engineer, statistician and distribution engineer of the New York & Queens Electric Light & Power Company, operating on Long Island. He next became engineer of distribution of the Counties Gas & Electric Company, Norristown, Pa., and later assistant to the electrical engineer of the United Gas Improvement Company.

J. J. Coleman Honored Again

Another honor has been conferred upon Jilson J. Coleman, vice-president and general manager of the Scranton Railway, Scranton, Pa., and one of the oldest living executives in point of service in the street railway systems of the United States. At the Nov. 19 meeting of the executive committee of the Pennsylvania Street Railway Association, held at Philadelphia, Mr. Coleman was unanimously elected president to succeed Frank Phillips, resigned.

Prior to 1920 Mr. Coleman's activities in the railway field escaped fairly well the limelight, but in that year he became the general manager at Scranton, and then his long and varied career was flashed as if in kaleidoscopic view before the railway world. The new general manager had just spent two years as district engineer of the passenger transportation division of the United



J. J. Coleman

States Shipping Board, Emergency Fleet Corporation, under A. Merritt Taylor, former traffic commissioner of Philadelphia. In this position he was responsible for providing adequate transportation for shipworkers in the territory extending from Boston to Houston.

Forty-four years ago, when horse cars and mule cars were the order of the day, a young man became railway clerk in Louisville, Ky., in the Central Passenger Railway. With the fire in him to succeed, he worked his way up to chief clerk and then managed the lines in New Albany, Ind. When he later moved to Cleveland, Ohio, the stage was set for his association with Tom L. Johnson, a romantic figure of that city, whom he assisted in the electrifying of the horse car lines there. Mr. Coleman later, with the co-operation of some of his own clan and that of the Johnsons, built the lines from Allentown to South Bethlehem and from Allentown to Catasauqua, now included in the system of the Lehigh Valley Transit Company. The company at Allentown, which was financed by R. T. Wilson & Company, purchased the lines from Allentown to Bethlehem and consolidated the two companies. They next rehabilitated the Yonkers system, and in 1895 started the Nassau Electric Railroad, Brooklyn, N. Y., now included in the Brooklyn-Manhattan Transit System.

Such activity might have sufficed for the output of ordinary men, but Mr. Coleman had never really been a member of that class. He next managed the consolidation of the St. Louis and Washington systems for Brown Brothers, bankers of New York, and then constructed the line of the New Jersey & Pennsylvania Traction Company between Trenton and Princeton, which had been started by Albert L. Johnson. In addition he investigated the railway properties of Pittsburgh, St. Louis, Washington, San Francisco, Indianapolis and Baltimore.

Something of the appreciation felt for Mr. Coleman was noted in the spring of last year, when he was promoted to the position of operating vice-president by A. E. Fitkin, who, under the General Engineering & Management Corporation, purchased the Scranton Railway. Mr. Coleman at that time was retained to continue his duties as general manager. In this post he has charge of a system of railway lines 83 miles in extent and a co-ordinated bus system operating in the heart of the hard coal district of Pennsylvania.

E. B. Williams Advanced

E. Bryan Williams has been appointed associate superintendent of transportation of the first division of the United Railways, St. Louis, Mo., with headquarters at Newstead Station. This appointment brought to light the short but ambitious career of a young man from a Missouri village who made his own way through Washington University, was recommended for a trip to the laboratories at Schenectady, engaged in research work for the Union Electric Company, St. Louis, and later became affiliated with the United Railways in the auditing and accounting department. He has also worked in the power and transportation departments.

W. O. Haymond has been made manager of the Muncie district of the Indiana Service Company, supplying electric light, power and railway service to that city. He succeeds Roy L. Thurman, resigned. Mr. Haymond has been in the service of the Indiana company 23 years.

John W. Campbell is to be appointed by Gov. Sam A. Baker of Missouri secretary of the State Public Service Commission to succeed State Senator Larry Brunk, Aurora, who has been named secretary of the newly formed Workmen's Compensation Commission for Missouri. Mr. Campbell will assume his new duties on Jan. 1, but until that time will be employed by the commission in some other capacity.

B. H. Kroger, banker and chain store merchant, has been nominated by Mayor Seasongood of Cincinnati to be a member of the Cincinnati Rapid Transit Commission. It was understood that the Mayor had consulted the members of Council privately before announcing the appointment. Mr. Kroger will take the place of E. H. Dornette, whose term has expired. Mr. Kroger will be the first member of the commission to serve under the law without receiving a salary.

Manufactures and the Markets

News of and for Manufacturers—Market and Trade Conditions
A Department Open to Railways and Manufacturers
for Discussion of Manufacturing and Sales Matters

Self-Regulation of Business Object of Chicago Meeting

Plans for carrying out the national program for the elimination of costly trade abuses and unethical business practices, which has for its object the eventual complete self-regulation of American business, will be outlined at a meeting of the National Trade Relations Committee of the United States Chamber of Commerce to be held in Chicago on Dec. 3.

Encouraged by the progress reported at a meeting held a few weeks ago, attended by representatives of 29 trade associations, the committee is preparing to extend its activities by working out a specific course of action. To this end, a detailed plan of procedure will be submitted by A. Lincoln Filene, Boston, the chairman of the committee.

The plan proposes practical methods for the formation within the various trades of joint trade relations committees composed of manufacturers, wholesalers and retailers.

Conditions which suggest the need for such trade relations committees to take the lead in adjusting controversies in the individual trades and in establishing business standards will be discussed by members of the national committee with representatives of trade associations with headquarters in the central states.

As a further step toward organizing its activities, a resolution defining the scope of its program has been prepared as a guide for the work of the committee. The resolution emphasizes particularly that "the purposes and efforts of the National Trade Relations Committee and Joint Trade Relations Committee shall be confined to the abatement of such unethical practices as are not contemplated by the Federal Trade Commission and as are not generally regarded as illegal."

New Rectifier Substation Opened by Gary Railways

As a result of an exhaustive study of its performance on other light-load interurban lines, the Gary Railways, Gary, Ind., recently installed a mercury arc rectifier in its new 500-kw. automatic substation at Woodville Junction, Ind. The machine was built by the American Brown Boveri Company, Camden, N. J.

The new substation represents an investment of approximately \$33,000. It is the principal power distributing center on a 25-mile interurban line running between Gary and Valparaiso and replaces a portable substation that has been carrying the load on this line ever since the company's old rotary converter substation at Goodrum was burned last year. The rectifier is the first device of its kind ever to be em-

ployed on the Gary Railways and will supply energy to the Valparaiso division only, over which light-weight, one-man cars are operated on a two-hour headway.

On account of the relatively light load, it is expected that the mercury arc rectifier will bring about a considerable improvement in operating conditions and will tend to cut down operating and maintenance costs.

Record Made by Oldest Roller Bearing Car

Car No. 201 of the Peoples Railway, Dayton, Ohio, equipped with Rollway journal bearings, was placed in service March 31, 1912, and made 90,000 miles during the first two years without any attention. These bearings were replaced in November, 1914, with bearings of an improved design, and these have been in operation ever since. The operating men like this car and it is reported as being in almost continuous service. It is believed that this is the oldest roller-bearing rail car that is still in regular operation.

Replacement Business in Tires Good

Solicitation of spring dating orders from tire dealers, which started on Nov. 15, is expected to stimulate manufacturing schedules during the normally dull winter months. During the past month production of tires has been gradually diminishing, owing to a slowing up in the retail field, as well as in orders from the automobile, bus and truck manufacturers for original equipment. Dealers have continued to place good sized orders for bus tires, but the bus manufacturers have not been buying as heavily as formerly.

More talk is heard in the tire industry about the so-called evil of selling tires to bus operators on a mileage basis, but those opposed to it seem to be making little progress toward correcting the practice. Some manufacturers are even guaranteeing their tires to give as high as 30,000 to 40,000 miles service. Some years ago tires sold to the general public had a mileage guarantee, but the policy was abandoned because of its impracticability and patent injustice to the manufacturer and dealer. Many authorities say the same situation seems to have arisen in the bus tire field.

Radical changes in the future manufacturing process of tires and inner tubes are seen in a new development in compounding, milling and vulcanizing rubber. Engineers are said to have demonstrated that tubes made by the process wear longer than others, although less crude rubber is used in their composition. As yet no practical

way has been found for adapting the process to the manufacture of casings, but experiments are being continued along this line.

Graham Brothers' Nine Months Record

Sales of Graham Brothers' motor coaches and trucks during the first nine months of this year were 78.4 per cent greater than the record for the first nine months of last year. Total sales for the first nine months were 29,336 units.

From the very beginning, according to a statement by the manufacturer, sales of Graham Brothers' truck and motor coaches have shown steady increases. In a statement made by them Graham Brothers say a total of 1,086 units in 1921 marked their initial sale. Sales in 1922 of 3,401 units was an increase of 213 per cent over the first year, while a total of 6,971 units in 1923 was an increase of 105 per cent over the previous year. Sales in 1924 of 10,791 showed another gain of 55 per cent over the year before, while in 1925 this record was again shattered with a total sale of 24,056 units, an increase of 123 per cent over 1924.

A.C.F. Small Bus Coming

With the number of *News Regarding Transportation* for November, the American Car & Foundry Company started another valuable service and from time to time hereafter will discuss some particular phase of transportation which is vital to modern economic life. In addition, a summary of the most important railway developments will be presented in clear, understandable manner.

One of the things the company does is to explain why the company entered the motor field. It says that the first practical result from the formation of the American Car & Foundry Motors Company was the winning of a contract to furnish 50 buses for the service operated by the city of Detroit. The company's program now contemplates the production of a small bus such as an eighteen-passenger parlor car or 21-passenger street car, and also a line of four or five truck models. Details of these are now being worked out at the company's Detroit plant.

It is explained that the first step taken by the company toward establishing the new bus activity was to look about for an existing motor bus and satisfactory engine. It found the bus in the Fageol safety coach and discovered also that one of the principal factors in Fageol efficiency was the engine—the Hall-Scott motor. So these two companies were acquired by the American Car & Foundry Company through the formation of the American Car & Foundry Motors Company, the stock of which was exchanged for that of Fageol and of Hall-Scott Motors. During these preliminary negotiations, it became apparent that the J. G. Brill Company, Philadelphia, was also in search of an efficient motor bus and engine which it could supply to its customers. The American Car & Foundry Company and the J. G. Brill

Company were in no sense competitors, but it chanced that about the same time they were both seeking the opportunity to furnish the same sort of service to their respective patrons. So it was that they joined forces, and the combination was effected by the formation of the Brill Corporation, whose stock was issued in exchange for that of the American Car & Foundry Motors Company and the J. G. Brill Company, the control of the Brill Corporation stock resting with the American Car & Foundry Company.

Rolling Stock

Pennsylvania Railroad, Philadelphia, Pa., is reported to be contemplating the purchase of 60 multiple-unit cars, presumably for service in connection with the Philadelphia - West Chester - Wilmington electrification upon which the company is now engaged.

Jacksonville Traction Company, Jacksonville, Fla., contemplates, as part of its plan for extending and improving that property under a new franchise now under negotiation, purchasing fifteen new double-truck cars at an estimated cost of \$225,000 and seven buses at a probable cost of \$46,000.

Lincoln Traction Company, Lincoln, Neb., has purchased twelve 25-passenger Mack coaches and two 21-passenger Studebaker coaches. The two Studebakers and six of the Macks have already been received and operation has been started on the South Fourteenth Street and penitentiary and the agricultural college and University Place lines.

Portland Electric Power Company, Portland, Ore., will purchase eight buses before Feb. 15 for use on the Ross Island bridge line, now almost completed. The new service will cover southeastern Portland, a district heretofore not adequately provided with public transportation.

Youngstown Municipal Railway, Youngstown, Ohio, will negotiate for the immediate purchase of five new buses. Traction Commissioner Engle stated recently that peak service required 50 buses, that it controlled 51 vehicles, but that at present it was without any excess capacity in vehicles.

Metal, Coal and Material Prices

Metals—New York		Nov. 23, 1926
Copper, electrolytic, cents per lb.	13.475	
Copper wire, cents per lb.	16.00	
Lead, cents per lb.	8.00	
Zinc, cents per lb.	7.52	
Tin, Straits, cents per lb.	72.375	
Bituminous coal, f.o.b. Mines		
Smokeless mine run, f.o.b. vessel, Hampton Roads, gross tons.	\$8.125	
Somerset mine run, Boston, net tons.	2.625	
Pittsburgh mine run, Pittsburgh, net tons.	2.425	
Franklin, Ill., screenings, Chicago, net tons.	1.875	
Central, Ill., screenings, Chicago, net tons.	1.525	
Kansas screenings, Kansas City, net tons.	2.35	
Materials		
Rubber-covered wire, N. Y., No. 14, per 1,000 ft.	\$6.00	
Weatherproof wire base, N. Y., cents per lb.	17.50	
Cement, Chicago net prices, without bags.	2.10	
Lined oil, (5-bbl. lots), N. Y., cents per lb.	11.2	
White lead in oil (100-lb. keg), N. Y., cents per lb.	14.75	
Turpentine (bbl. lots), N. Y., per gal.	\$0.89	

Municipal Railway, San Francisco, Cal., contemplates purchasing fifteen more cars. Track of the matter was for a time almost lost in the byways of officialdom. Several weeks ago the necessary appropriation was held up by Chairman James B. McSheehy of the finance body due to a bonus clause in the contracts, but it has since been decided to let the contracts and permit cars to be built as soon as possible. City Attorney John J. O'Toole advised the committee that new contracts would have to be awarded if the offending clause was stricken out. Moreover, the finance committee of the Board of Supervisors has approved an appropriation of \$100,000 to purchase motors for the new rolling stock.

Trade Notes

American Brown Boveri Electric Corporation, New York, N. Y., has announced that W. R. Foster, formerly sales engineer with the Bridgeport Brass Company, Bridgeport, Conn., has joined its staff to engage in sales promotion activities. He will be located at 165 Broadway, New York City. He is a graduate of Columbia University in engineering.

Ohio Brass Company, Mansfield, Ohio, has established new quarters for its San Francisco and Los Angeles branch offices. The new address of the San Francisco office is Room 531-532-533 Matson Building, 215 Market Street, telephone Davenport 9383. The Los Angeles office location is Room 508 Subway Terminal Building, 417 South Hill Street, telephone Mutual 3506. In both of these cities the company will continue to carry ample stocks of its various products for the convenience of the Western trade.

George T. Marchmont has been appointed Southern district manager of the Graybar Electric Company, New York, N. Y. Mr. Marchmont's headquarters will be at Atlanta, Ga. Until the announcement of his present appointment was made he was manager of the branch office at Richmond, Va. Mr. Marchmont succeeds Howard Hall, who has been promoted to the staff of Frank A. Ketcham, executive vice-president of the company, with headquarters in New York.

New Advertising Literature

American Brown Boveri Electric Corporation, New York, N. Y., has issued descriptive circular No. 301 on mercury arc power rectifiers for manual or automatic control.

Cummings Car & Coach Company, Chicago, Ill., has published a booklet which contains photographs and principal specifications of some of the recent modern rolling stock built by the company for city, suburban and inter-urban service.

Economy Electric Devices Company, Chicago, Ill., has issued a reprint from the Sept. 18, 1926, issue of the *ELECTRIC RAILWAY JOURNAL* entitled "Many Variables Affect Energy Consump-

tion by Electric Railways," by J. T. Lake. The company has also reprinted its "ad" from the *ELECTRIC RAILWAY JOURNAL* of Sept. 25, 1926, called "Cleveland Saves Power."

Westinghouse Electric & Manufacturing Company, East Pittsburgh, Pa., has published a rearranged and revised circular on supervisory control and its equipment. This publication first deals with a general discussion of supervisory control beginning at the first successful installation of the property of the Cleveland Railway. The publication then takes up synchronous visual type of equipment, the code visual type and audible type and finishes with a discussion of the supervisory control protective equipment. Illustrations assist in clarifying the discussion.

Interflash Signal Corporation, New York, N. Y., has prepared specifications and drawings as well as descriptive matter showing Interflash traffic signals and signs for use at highway intersections, railway crossings and at other points where traffic warning or direction is essential. These signals comply with the standards adopted by the American Association of State Highway Officials and approved for use on all federal aid highways by the United States Department of Public Roads.

Botfield Refractories Company, Philadelphia, Pa., recently appointed the following concerns as distributors for its product, adamant fire brick cement: The Curtis Supply Company, Inc., Washington Street at Perry, Buffalo, N. Y.; The Waldredh Supply Company, 707-711 Cherry Street, Des Moines, Iowa; South Side Foundry & Machine Works, Charleston, W. Va., and the Empire Machinery & Supply Corporation, 409-411 Water Street, Norfolk, Va.

Timken Roller Bearing Company, Canton, Ohio, has issued a two-page folder descriptive of the positive roll alignment which is a late advance in the design of roller bearings. In this design the rib of the cone is undercut so that the large end of each roller makes contact at separate areas. The rollers are thus kept at right angles to the shoulder of the cone.

Reo Motor Car Company, Lansing, Mich., has issued a circular letter giving complete operating costs on a fleet of ten Reo model W pay-enter buses in service by the Southwest Missouri Railroad Company in Joplin, Mo., over a total of 417,214 miles in the course of one year's operation. Detailed figures on the various items of operating expense are included. Cost per mile for operation is stated by the Reo company to be less than 8 cents per mile.

Bethlehem Steel Company, Bethlehem, Pa., has published a booklet in which are set forth the several advantages of Bethlehem stainless steel and stainless iron. It is pointed out that the total yearly loss of metal due to corrosion is more than 25 per cent of the new metal produced in the world each year, and the increased use of stainless steel and stainless iron would materially reduce this deterioration and loss. Various technical data are contained in the booklet to show the physical characteristics of these two products.

As might be expected—

The Berkshire Street Railway of Pittsfield, Mass., in constructing twelve of the first cars to be built according to the standard design adopted by the A.E.R.A. special committee on the essential features of modern cars, specified

Berkshire Cars Will Follow A.E.R.A. Specifications for Interurban Units

Some of the first cars to be built according to the standard design adopted by the American Electric Railway Association special committee on the essential features of modern cars are twelve interurban units for the Berkshire Street Railway of Pittsfield, Mass. The cars are being constructed by the Osgood-Bradley Car Company, Worcester, Mass. They will be used in interurban service in the territory served by the Berkshire Company. Seats for 50 passengers are provided in the design. Specifications follow:

Weight 37,000 lb.
Bolster centers, length 24 ft. 11 in.
Length over all 48 ft. 10 in.
Truck Wheelbase 5 ft. 6 in.
Width over all 8 ft. 8 in.
Height, rail to trolley base 11 ft. 3 in.
Body Semi-steel
Interior trim Mahogany
Headlining Nevasplit
Roof Arch
Air Brakes General Electric
Armature bearings Plain
Axles Carnegie Steel Co.
Bumpers Osgood-Bradley
Car signal system Consolidated Car Heating Co.
Car trimmings J. L. Howard & Co.
Center and side bearings Osgood-Bradley Car Co.
Compressors General Electric CP-27B
Conduits and junction boxes Osgood-Bradley
Control General Electric K-35-KK
Couplers Osgood-Bradley
Curtain fixtures Curtain Supply Co.
Curtain material Fantasote
Destination signs Electric Service Supplies Co.
Door operating mechanism National Pneumatic Co.
Fenders or wheelguards Osgood-Bradley
Finish Sherwin-Williams enamel
Gears and pinions General Electric
Hand brakes National Brake Co.
Heater equipment Consolidated Car Heating Co.
Headlights General Electric
Journal bearings Osgood-Bradley, plain
Journal boxes Symington
Lightning arresters General Electric
Motors Four G.E. 265-A, inside hung
Registers Ohmer
Safety Devices Safety Car Devices Co.
Sanders Osgood-Bradley
Sash fixtures Curtain Supply Co.
Seats Heywood-Wakefield Co.
Seating material Real Spanish leather
Springs Osgood-Bradley
Step treads Mason
Trolley rollers Earl
Trolley base US-20-A
Trolley wheels General Electric
Trucks OBC-45-66
Ventilators Garland
Wheels Wrought Steel A.E.R.A.-A-3

Peacock Brakes!

The qualifications of Peacock Brakes make them especially adopted for the modern car.

Let us send you complete particulars of design and Peacock performance record.

NATIONAL BRAKE CO., Inc.
890 Ellicott Sq., BUFFALO, N. Y.

Canadian Representatives:
Lyman Tube & Supply Company, Limited, Montreal, Canada





Knowledge of Industry

In the heart of the industrial centers of America, the McGraw-Hill Publishing Company has placed its district offices—that manufacturers may have available quickly and conveniently the McGraw-Hill service, data and knowledge of industry.

Every manufacturer who would sell industry more efficiently is now almost in the shadow of a McGraw-Hill office. Right at his elbow is the identical knowledge of industry and industrial marketing which has proved of such value to manufacturers who have availed themselves of it.

Each office is in charge of a district manager, who, through previous experience in industry or long service with McGraw-Hill, is well qualified to counsel with manufacturers on methods of selling to industry. His staff includes Marketing and Advertising men who have been drawn from industry, and whose contacts with industry are kept fresh by constant work on industrial selling problems.

Back of these men, as a reserve force of the district office, are the entire McGraw-Hill editorial, circulation, marketing and advertising staffs. Manufacturers consulting these district offices are thus assured all of the McGraw-Hill resources in applying the McGraw-Hill Four Principles of Industrial Marketing to their own selling.

These Four Principles are fundamental to waste-free selling. Briefly stated they are: (1) Determination of Markets; (2) Their Buying Habits; (3) Their Channels of Approach; (4) Appeals that Influence.

While each manufacturer is best able to apply these Four Principles for himself, the McGraw-Hill Publishing Company can be of material assistance in counseling with manufacturers and in either supplying data or suggesting how it may be obtained. This service is gladly furnished and we welcome the opportunity to serve manufacturers and their advertising agents in the interest of more effective marketing. A conference may be arranged, either in your office or a McGraw-Hill office.



Brought to Industry's Door

McGraw-Hill's District Office Facilities—

105 advertising salesmen, whose first function is to advise on marketing problems, serve industry and trade through McGraw-Hill district offices.

36 seasoned advertising planners and writers and 20 artists, all trained in the appeals and mechanics of industrial advertising, supplement the district offices' marketing staffs.

These men and 108 McGraw-Hill editors have a background of practical experience in selling or production in 58 broad classifications of industry.

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This district office set-up is in conformity with the McGraw-Hill Four Principles of Industrial Marketing which stipulate "selling in terms of the prospect's problems."

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McGraw-Hill Publications

45,000 Advertising Pages used Annually by 3,000 manufacturers to help Industry buy more effectively.

CONSTRUCTION & CIVIL ENGINEERING

ENGINEERING NEWS-RECORD
SUCCESSFUL METHODS

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ELECTRICAL WORLD JOURNAL OF ELECTRICITY
ELECTRICAL MERCHANDISING

INDUSTRIAL

AMERICAN MACHINIST INDUSTRIAL ENGINEER
CHEMICAL & METALLURGICAL ENGINEERING
POWER

MINING

ENGINEERING & MINING JOURNAL
COAL AGE

TRANSPORTATION

ELECTRIC RAILWAY JOURNAL
BUS TRANSPORTATION

OVERSEAS

INGENIERIA INTERNACIONAL
AMERICAN MACHINIST
(European Edition)

RADIO

RADIO RETAILING

CATALOGS & DIRECTORIES

ELECTRICAL TRADE CATALOG
ELECTRICAL ENGINEERING CATALOG
RADIO TRADE CATALOG
KEYSTONE CATALOG (Coal Edition) KEYSTONE CATALOG (Metal-Quarry Edition)
COAL CATALOG CENTRAL STATION DIRECTORY
ELECTRIC RAILWAY DIRECTORY
COAL FIELD DIRECTORY
ANALYSIS OF METALLIC AND NON-METALLIC
MINING, QUARRYING AND CEMENT INDUSTRIES

Free Holiday Stamping Offer

A chance to get RICHEY with
your name, or a friend's name,
stamped in gold on the front cover

*Right on your
desk—the data
you want*

Electric railway executives, engineers and operating men have long respected Richey's **ELECTRIC RAILWAY HANDBOOK** as the one great pocketbook of practice data, formulas and tables in the electric railway field.



The second edition of Richey covers the latest developments—describes new methods—records changes in theory and practice. It covers every phase of electric railway work from Roadbed and Track to Signals and Communication.

Until January 1, 1927, we will stamp your name, or a friend's name, in gold on the front cover of any McGraw-Hill Book without additional charge. Orders for stamped copies should be accompanied by price and, of course, stamped books are not returnable.

*Send
for
your
copy
today*

Get a copy of Richey for yourself.

Get a copy for a friend.

Act now—while the free stamping offer is in force. Fill out the coupon and get it into today's mail.

SPECIAL HOLIDAY COUPON

McGraw-Hill Book Co., Inc., 370 Seventh Ave., New York.

.....Send me Richey's **ELECTRIC RAILWAY HANDBOOK**, \$4.00, with name stamped in gold on front cover. I enclose proper remittance and understand that stamped copies are not returnable. (This offer expires Jan. 1, 1927.)

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(Name to be stamped)

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Address

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Shuler Front Axles



For Motor Busses

Safe and Save

Our way of manufacturing **FRONT AXLES FOR MOTOR BUSSES** restricts us to the well-known path that is straight and narrow.

Sticking to quality results in a strong, sturdy, dependable **FRONT AXLE** that begets public confidence and patronage.

If sales gains are a guide—we are on the right path.

Shuler Axle Co.

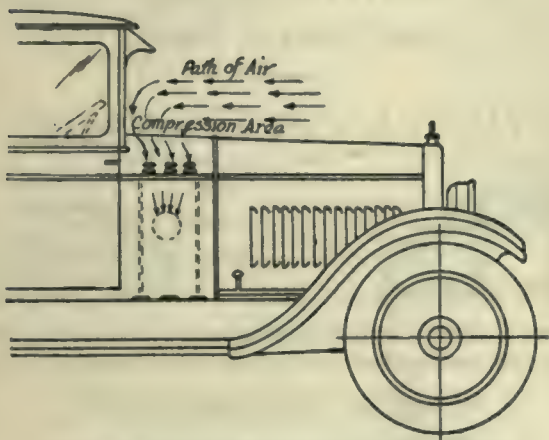
INCORPORATED
LOUISVILLE, KY.

Member of Motor Truck Industries, Inc. of America



Nick Lynt says:

**"They Put
It Up
to
Us"**



"How can we cool the space under the cowl—rain or shine? How can we put cool air around the engine under the hood? These questions were put up to us by a leading body builder.

"They were old puzzles, and the bus maker felt that with our long experience in ventilation, we might be able to solve them.

"And we did. Making use of the fact that air is compressed at a certain point in front of a moving body (a fact obtained from our research file), we evolved the 'Venti-Duct' illustrated above. The Venti-Duct is applicable in several forms, and can be installed on any type body. This device (patent applied for) is absolutely weatherproof, and gives the driver as much cool air as he desires without draft or dust.

"A variation of the same principle, called the 'Compensating Duct,' takes care of the engine requirements.

"As you carefully study your job, so we study ours—we've been studying vehicle ventilation for years. We've found out many things. If you have a problem, let us see if our experience won't solve it.

"In the meantime, send for full information on the Venti-Duct and the Compensating Duct, including our excellent licensing plan."

THE NICHOLS-LINTERN CO.

7960 LORAIN AVENUE

CLEVELAND, OHIO

Nuttall

Standard Helical Gears Save the Motors



That shock of acceleration that is inevitable with spur gearing springs bolts, strains bearings, loosens insulation, cuts gear life and motor life, and piles up maintenance.

The motors suffer; body work suffers and soon begins to creak.

Nuttall BP Helical Gears will stop this profit leak. The meshing of the teeth is like the turning of a screw—smooth, vibrationless, noiseless, shockless. There is no grinding and no chattering.

We'll be glad to cooperate in *proving* their economy on your cars. Consult us.

*Write for our
Helical Gear Book*

R.D. NUTTALL COMPANY
PITTSBURGH  PENNSYLVANIA

All Westinghouse Electric & Mfg. Co. District Offices are Sales Representatives in the United States for the Nuttall Electric Railway and Mine Haulage Products. In Canada: Lyman Tube & Supply Co., Ltd., Montreal and Toronto.





Phoenix Electric Refrigerator Cars continue to give extraordinary service in winter by protecting perishable goods against low outside temperatures. All the year 'round they are steady business builders and profit makers.

Phoenix equipped cars present many advantages over ice refrigerator cars. They require no building of ice stations or organizing of a supplementary organization to care for them. The regular train crew can give all the attention needed incidental to their other duties as Phoenix Cars are entirely automatic in operation.

A Phoenix Car can set over at a siding without attendance until picked up again. It may run over elevated tracks as there are no drippings from ice bumpers.

Send for all the particulars

The Phoenix Ice Machine Co.
Cleveland Ohio

PHOENIX
ICE MACHINE

Phoenix
Transportation
Refrigerating
Unit.

PANTASOTE

Trade Mark

Seat and Curtain Materials
There is no substitute for Pantasote

AGASOTE

Trade Mark

Roofing—Headlining—Wainscoting
The only homogeneous panel board

*standard
for electric railway cars
and motor buses*

The PANTASOTE COMPANY Inc.

At 46th- 250 Park Avenue - Street
NEW YORK



The DIFFERENTIAL CAR



Standard on
60 Railways for

Track Maintenance
Track Construction
Ash Disposal
Coal Hauling
Concrete Materials
Waste Handling
Excavated Materials
Hauling Cross Ties
Snow Disposal

Use These Labor Savers

Differential Crane Car
Clark Concrete Breaker
Differential Bottom Dump Ballast Car
Differential Car Wheel Truck and Tractor

THE DIFFERENTIAL STEEL CAR CO., Findlay, O.

ELRECO TUBULAR POLES



COMBINE

Lowest Cost
Least Maintenance

Lightest Weight
Greatest Adaptability

Catalog complete with engineering data sent on request.

ELECTRIC RAILWAY EQUIPMENT CO.
CINCINNATI, OHIO

New York City, 30 Church Street



We make a specialty of
**ELECTRIC RAILWAY
LUBRICATION**

We solicit a test of TULC
on your equipment

The Universal Lubricating Co.
Cleveland, Ohio
Chicago Representatives: Jameson-Ross Company,
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BOYERIZED CAR PARTS



Brake Pins	Spring Post Bushings
Brake Hangers	Spring Posts
Brake Levers	Bolster and Transom
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Brake Fulcrums	Manganese Brake Heads
Turnbuckles	Bushings
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Can be purchased through the following representatives:

Economy Electric Devices Co., Old Colony Bldg., Chicago, Ill. F. F. Bodler, 903 Monadnock Bldg. San Francisco, Cal. W. F. McKenney, 54 First Street, Portland, Ore. L. H. Denton, 1328 Broadway, New York City, N. Y. A. W. Arlin, 772 Pacific Electric Bldg., Los Angeles, Cal.

Bemis Car Truck Company
Springfield, Mass.



Easton turntable at the
Communipaw Terminal,
B. & O. R.R.

EASTON TURNTABLES

for:

Turning Cars, Buses
Rail-Cars, etc. For
use in Shops and
Garages

The Baltimore & Ohio Railroad solved the problem of turning its buses in a small space with an *Easton Turntable*!

Its economic advantages led the engineers of this railroad to install this equipment.

There are many places where an *Easton Turntable* can be installed profitably—in saving time and labor—in economy of space—in speeding traffic—in expediting shop and garage practices—and many others.

Their installation cost is low and maintenance practically nil—at most a few cents for lubrication!

Offices in:

New York
Kansas City
Philadelphia
Pittsburgh
Chicago
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EASTON CAR & CONSTRUCTION CO.
Easton, Pa.

A Complete Line of Compressed Air Machinery for the Railroad

PNEUMATIC TOOLS

Pneumatic Drills
Riveting Hammers
Pneumatic Grinders
Air Motor Hoists
Sand Rammers
Tie Tamper
Rail Drills
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Clay and Trench Diggers
Paving Breakers
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AIR COMPRESSORS

Any Capacity
Any Pressure
Any Drive
Stationary
Portable
Tie Tamper

Other Products

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Cameron Drainage
Cameron Roller Feeders
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OIL ENGINE-ELECTRIC LOCOMOTIVES

OIL ENGINES



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Whatever your requirements

specify

**Le Carbone Carbon
Brushes**

They talk for themselves

W. J. Jeandron

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Engineers—Constructors

Oil Refineries and Pipe Lines, Steam and Water Power Plants, Transmission Systems, Hotels, Apartments, Office and Industrial Buildings, Railroads.

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Transmission Line and Special Crossing
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588 Park Place

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THE P. EDWARD WISH SERVICE

50 Church St.
NEW YORK

Street Railway Inspection
DETECTIVES

131 State St.
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prices, a mention of the Electric Railway
Journal would be appreciated.

Our advertisement in the issue of November 20 showed how

HASKELITE and PLYMETL

cars require practically no maintenance.

Another ad will appear next week.

HASKELITE MANUFACTURING CORPORATION
133 W. Washington St., Chicago, Ill.

Hale and Kilburn SEATS

Better Quality Seats
For Cars and Buses

Hale-Kilburn Co.
1800 Lehigh Ave., Philadelphia, Pa.

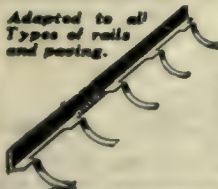


STUCKI SIDE BEARINGS

A. STUCKI CO.
Oliver Bldg.
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RAIL GRINDERS AND WELDERS

Railway Track-work Co., Philadelphia
682



Adapted to all
Types of rails
and paving.

GODWIN Steel Paving Guards

Proven by service to economically prevent
seepage and disintegration of street railway
paving.

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BLOCK SIGNALS

FOR

ELECTRIC RAILWAYS

HIGHWAY CROSSING SIGNALS



UNA

RAIL BONDS—RAIL JOINTS
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Cleveland, Ohio.

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Lever-Operated and Slip Change Carriers

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"Axle Specialist Since 1866"

Address all Mail to Post Office Box 515, Richmond, Va.

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J. R. JOHNSON AND CO., INC.
FORGED STEEL AXLES

For Locomotives, Passenger, Freight and Electric Cars

Smooth Forged or Rough Turned—Carbon or Alloy Steel—Plain or
Heat Treated, Forged and Turned Piston Rods, Crank Pins, Large
Shafts, Round Bars, etc.

Eliminate rail joints
by

THERMIT-WELDING

METAL & THERMIT CORPORATION
120 Broadway, New York City, N. Y.



AMERICAN BRIDGE COMPANY

EMPIRE BUILDING—71 BROADWAY NEW YORK, N. Y.

*Manufacturers of Steel Structures of all classes
particularly BRIDGES AND BUILDINGS*

ALSO STEEL BARGES FOR HARBORS AND RIVERS, STEEL TOWERS
FOR ELECTRIC TRANSMISSION, HEROULT ELECTRIC FURNACES, ETC.

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Salt Lake City, Utah

Duluth, Minn.
Minneapolis, Minn.

Pacific Coast Representative:
U. S. Steel Products Co.,
Pacific Coast Dept.
San Francisco, Cal.
Los Angeles, Cal.
Portland, Ore.
Seattle, Wash.

Export Representative: United States Steel Products Co., 30 Church Street, New York.

Tisco Manganese Steel in trackwork,
introduced by Wharton in 1894, is
still the superior metal for long life
under severest railway service.

WILLIAM WHARTON JR. & CO., Inc.
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-Carnegie-

the name
to look for
on Steel

CARNEGIE STEEL COMPANY
PITTSBURGH - PENNA.

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LUDLUM
1854
**Tool Steel
HURON**

THE SUPER ENDURING TOOL STEEL
FOR BLANKING SILICON TRANSFORMER
SHEETS AND ARMATURE DISCS

LUDLUM STEEL CO.
WATERVLIET
N. Y. - U. S. A.

WE HAVE A
SPECIAL TOOL STEEL FOR
EVERY SPECIFIC PURPOSE.

Lorain Special Trackwork Girder Rails

Electrically Welded Joints

THE LORAIN STEEL COMPANY

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Sales Offices:

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SPECIALISTS

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of

**Standard—Insulated—and
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The Rail Joint Company
165 Broadway, New York City

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National Railway Appliance Co.

Grand Central Terminal, 452 Lexington Ave., Cor. 45th St., New York

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Hegeman-Castle Corporation, Railway Exchange Building, Chicago, Ill.

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National Hand Holds
Genesco Paint Oils
Dunham Hopper Door Device
Garland Ventilators
Walter Tractor Snow Plows
Feasible Drop Brake Stalls

Ft. Pitt Spring & Mfg. Co.,
Springs
Flaxlinum Insulation
Anderson Slack Adjusters
Economy Electric Devices Co.,
Power Saving and Inspection
Meters
Yellow Coach Mfg. Company—
Single and Double-deck Buses

SEARCHLIGHT SECTION

USED EQUIPMENT & NEW—BUSINESS OPPORTUNITIES

UNDISPLAYED—RATE PER WORD.

Positions Wanted, 4 cents a word, minimum 75 cents an insertion, payable in advance.

Positions Vacant and all other classifications, 8 cents a word, minimum charge \$2.00.

Proposals, 40 cents a line an insertion.

INFORMATION:

Box Numbers in care of any of our offices count 10 words additional in undisplayed ads.

Discount of 10% if one payment is made in advance for four consecutive insertions of undisplayed ads (not including proposals).

DISPLAYED—RATE PER INCH

1 to 3 inches \$4.50 an inch

4 to 7 inches 1.50 an inch

8 to 14 inches 4.10 an inch

Rates for larger spaces, or yearly rates on request. In advertising such is measured vertically on one column, 3 columns—20 inches—40 a page.

Over
6000
other
men
in the
Electric
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see this
page—

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Stands
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American Steel & Wire Co.
Bemis Car Truck Co.
Brill Co., The J. G.
- Steel and Steel Products**
American Steel & Wire Co.
Carnegie Steel Co.
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Brill Co., The J. G.
- Stokers, Mechanical**
Babcock & Wilcox Co.
Westinghouse E. & M. Co.
- Stop Signals**
Nichols-Lintern Co.
- Storage Batteries (See Batteries, Storage)**
- Storage Tanks**
S. F. Bowser Co.
- Strain Insulators**
Electric Service Supplies Co.
Ohio Brass Co.
Westinghouse E. & M. Co.
- Strand**
American Steel & Wire Co.
Roebbing's Sons Co., J. A.
- Street Cars (See Cars, Passenger, Freight, Express)**
- Superheaters**
Babcock & Wilcox Co.
- Sweepers, Snow (See Snow Plows, Sweepers and Brooms)**
- Switch Stands and Fixtures**
Ramapo-Ajax Corp.
- Switches and Switchboards**
Consolidated Car Heating Co.
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General Electric Co.
Westinghouse E. & M. Co.
- Switches, Selector**
Nichols-Lintern Co.
- Switches, Tee Rail**
Ramapo Ajax Corp.
- Switches, Track (See Track Special Work)**
- Tampers, Tie**
Ingersoll-Rand Co.
Railway Trackwork Co.
- Tapes and Cloths (See Insulating Cloth, Paper and Tape)**
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Ramapo Ajax Corp.
- Telephones and Parts**
Elec. Service Supplies Co.
- Telephone and Telegraph Wire**
American Steel and Wire Co.
- Terminals, Cable**
Standard Underground Cable Co.
- Testing Instruments (See Instruments, Electrical Measuring, Testing, etc.)**
- Thermocells**
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American Bridge Co.
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- Ties, Wood Cross (See Poles, Ties, Posts, etc.)**
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- Tongue Switches**
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American Steel & Wire Co.
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General Electric Co.
Westinghouse E. & M. Co.
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ALPHABETICAL INDEX TO ADVERTISEMENTS

A	Page		Page	L	Page	S	Page
American Brake Shoe and Foundry Co.	8	Electric Railway Improvement Co., The	37	LeCarbone Co.	29	Samson Cordage Works.	37
American Brass Co., The.	37	Electric Service Supplies Co.	9	Lorain Steel Co.	32	Sanderson & Porter	30
American Bridge Co.	32			Ludlum Steel Co.	32	Searchlight Section	33
American Car Co.	39					Shuler Axle Co.	26
American Electrical Works.	35	F		M		Smith Heater Co., Peter.	37
American Steel Foundries	6	Ford, Bacon & Davis.	10	McClellan & Junkersfeld	30	Standard Underground Cable Co	35
American Steel & Wire Co.	35	"For Sale" Ads.	33	McGraw-Hill Book Co.	26	Star Brass Works.	35
Anaconda Copper Mining Co.	37			Metal & Thermit Corp.	31	Stevens & Wood, Inc.	30
Archbold-Brady Co.	30					Stone & Webster	30
		G				Stucki Co., A.	31
B		General Electric Co., 22, Back Cover		N			
Babcock & Wilcox Co.	31	Godwin Co., Inc., W. S.	31	Nachod and U. S. Signal Co.	31	T	
Berler Organization	30	Gold Car Heating & Ltg. Co.	37	National Brake Co.	23	Timken Roller Bearing Co.,	
Bell Lumber Co.	37	Goodyear Tire & Rubber Co.,		National Pneumatic Co.	15	Front Cover	
Bemis Car Truck Co.	28	The	20-21	National Ry. Appliances Co.	32		
Bethlehem Steel Co.	16	Graham Bros.	10	Naugle Pole & Tie Co.	37	U	
Brennan, F. J.	31			Nichols-Lintern	27	Una Welding & Bonding Co.	31
Brill Co., The J. G.	39	H		Nuttall Co., R. D.	27	Universal Lubricating Co.	28
Buchanan & Layng Corp.	30	Hale-Kilburn Co.	31				
Bylesby Eng. & Management Corp.	30	Haskelite Mfg. Corp.	31	O		V	
		"Help Wanted" Ads.	33	Ohio Brass Co.	5	Van Loan Corp., Irving S.	33
C		Hemphill & Wells	30	Okonite-Callender Cable Com-			
Cameron Electrical Mfg. Co.	37	Holst, Englehardt W.	30	pany, Inc., The.	35		
Carnegie Steel Co.	32	Hubbard & Co.	35	Okonite Co., The.	35		
Chillingworth Mfg. Co.	37					W	
Cincinnati Car Co.	17	I		P		"Want" Ads.	33
Cleveland Fare Box Co.	31	Illinois Steel Co.	10	Pantasote Co., Inc.	28	Wason Mfg. Co.	39
Collier, Inc., Barron G.	18	Ingersoll-Rand Co.	29	Percy Mfg. Co., Inc.	37	Westinghouse Elec. & Mfg. Co.	2
Consolidated Car Fender Co.	37	International Register Co.	35	Phoenix Ice Machine Co.	28	Westinghouse Traction Brake Co.	4
Consolidated Car Heating Co.	37	International Steel Tie Co., The.	7	Positions Wanted and Vacant.	33	Wharton, Jr. & Co., Inc., Wm.	32
		Irrington Varnish & Insulator Co.	35			"What and Where to Buy"	34, 36, 38
D				R		White Eng. Corp., The J. G.	30
Day & Zimmermann, Inc.	30	J		Rail Joint Co., The.	32	Wish Service, The P. Edw.	31
Differential Steel Car Co., The.	28	Jackson, Walter	30	Railway Track-work Co.	31	Wood Co., Chas. N.	37
		Jeandron, W. J.	29	Railway Utility Co.	37		
E		Johnson & Co., J. R.	31	Ramapo Ajax Corp.	37	Y	
Easton Car & Construction Co.	29	K		Riehey, Albert	30	Yellow Truck and Coach Co.,	
Electric Equipment Co.	33	Kelker, DeLew & Co.	30	Roebbling's Sons Co., John A.	37	Insert 11, 12, 13, 14	
Electric Ry. Equipment Co.	28	Kuhlman Car Co.	39				

Continued from page 36

Trolley Material, Overhead	Tabling, Yellow & Black	Vestibule Linings	Welding Steel	Nuttall Co., E. D.
Electric Service Supplies Co.	Flexible Varnish	Haskelite Mfg. Corp.	Electric Railway Improve-	Star Brass Works
Ohio Brass Co.	Irrington Varnish & Ins.		ment Co.	
Westinghouse E. & M. Co.	Co.	Welded Rail Joints	Railway Trackwork Co.	Wheels, Wrought Steel
		Electric Railway Improve-	Una Welding & Bonding Co.	Carnegie Steel Co.
Trolley Wheel Bushings	Turbines, Steam	ment Co.		Illinois Steel Co.
Star Brass Works	General Electric Co.	Metal & Thermit Corp.		Ludlum Steel Co.
	Westinghouse E. & M. Co.	Ohio Brass Co.		
Trolley Wheels & Harps	Furnitures	Railway Trackwork Co.		Whistles, Air
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		Welders, Portable Electric		Westinghouse E. & M. Co.
Trolley Wheels (See Wheels	Turntables	Electric Railway Improve-		Westinghouse Traction
Trolley)	American Bridge Co.	ment Co.		Brake Co.
	Easton Car & Construction	Ohio Brass Co.		
	Co.	Railway Trackwork Co.		Wire Rope
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Trolley Wire	Valves	Westinghouse E. & M. Co.		Roebbling's Sons Co., J. A.
Amer. Electrical Works	Ohio Brass Co.			
Amer. Steel & Wire Co.	Westinghouse Tr. Br. Co.			Wires and Cables
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Enable electric railways to provide service which appeals to the public, stimulating the riding habit and thereby increasing revenue. The private automobile decreases as a factor in furnishing transportation when "inviting" modern cars are placed in service. And that is not all—

Convincing Facts

Compare operating costs. Check the experience of many railways which have taken advantage of the economies effected by light-weight modern cars, and then figure what they can do for your lines. Money saved is money earned. If interested we will be pleased to give you the benefit of our experience in displacing heavy and uneconomical equipment with new modern light-weight cars. Here's what the Lewistown & Reedsville Electric Railway accomplished—

Actual Operating Costs	Per Car Mile	
	Old Cars	New Cars
Way and Structures.....	4.71c	3.27c
Maintenance of Equipment.....	1.86	1.72
Power	12.63	7.11
Conducting Transportation.....	16.00	13.83
Traffic		
General and Misc.....	2.70	2.67
Total	37.90	28.60

Modern cars with their economic advantages are available to every electric railway.



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Bus facts from Philadelphia

No. 1

"The best evidence of our faith in the gas-electric bus is that we ordered 202 buses in January, 1925, and in January, this year, we found it advisable to place an additional order for 160 more of the same type."

No. 2

"The maximum mileage we have accumulated on any one vehicle (gas-electric) is 47,351 miles. This bus has been pulled-in twice, once for a broken starter and again for a burnt-out ignition coil."

No. 3

"Our average schedule speed, being the result of dividing the miles operated by the actual running time between terminals, is 12.02 miles per hour. In this calculation the interurban buses have been eliminated."

"... a factor which affects speed to the extent of 10 per cent affects costs to the extent of about 1½¢ for wages alone, and furthermore affects the fixed charges in the same ratio because as speed increases it is possible to give the same service with less equipment."

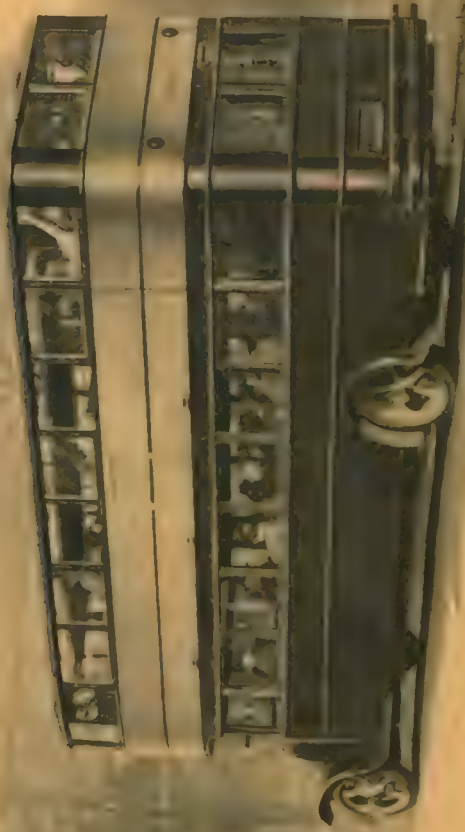
No. 4

"We find the mechanical-drive buses are averaging during a month about 24 miles per quart of oil, while our gas-electric buses show an average of about 38 miles."

From a paper by R. H. Horton, President, Philadelphia Rural Transit Company. His comments were based on 6 months' operation of gas-electrics.



Like other new General Electric products, gas-electric bus equipment was put on the market only after extensive engineering and practical tests had demonstrated the soundness of the principle and certainty of its success. G-E engineers have since gained added experience with equipments in service of varied character. Learn from them the importance of having electric drive



Nothing compares with the Gas-Electric

That the Gas-Electric bus has advantages, both from operating and maintenance standpoints, has been verified on every property where electric drive has been introduced.

Think of operation so quiet that residents who had complained of the noise of buses climbing a near-by hill in second gear registered no objections after motor-driven gas-electric buses were placed in service.

The driver, having no clutch to operate and no gears to shift, can keep his eyes on the road and the traffic, regulating his speed entirely by pressing the accelerator. This fact has a bearing on the two most costly phases of operation—wages per bus-mile and accidents.

Gas-electric bus operators are only beginning to realize the possibilities offered by this type of equipment for accurate testing with electrical instruments to determine definitely the results of overhauling the engine. Electrical measurements also furnish a means of knowing whenever any bus is not operating at maximum efficiency, whether the trouble be in the engine, the motive power, or with the driver.

GENERAL ELECTRIC

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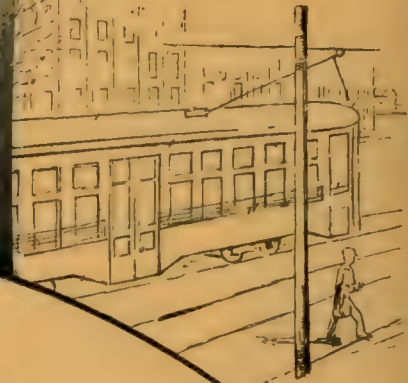
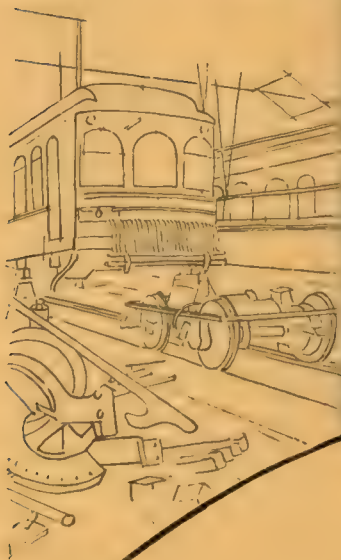
ELECTRIC RAILWAY JOURNAL

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Wheels that are convenient and error-proof in handling cannot be too good for bus drivers.

For the first time bus wheels are as good as they *can* be. Only Spoksteel principles make it possible. Spoksteel wheels are sponsored by the world's largest wheel builders.

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special Westinghouse varnish is a vital factor in Westinghouse motor performance. Selling it to you, apart from the motor, is chiefly to uphold Westinghouse standards in motor performance—a service which safeguards both Westinghouse reputation and your motors.

*Using Westinghouse insulation materials is like
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Vol. 68
No. 22

CONTENTS

Pages
993-1032

DECEMBER 4, 1926

Editorials	993
Twin City Lines Add a Well-Equipped Garage to Their Transportation System.....	996
New structure at Minneapolis to house 100 buses. It is an operating unit as well as a repair shop and storage room. Particular attention has been given to heating and ventilating.	
Bank Finds Chicago Electric Railways' Progress Remarkable	1000
Co-ordinated Service Recommended for Canton, Ohio	1001
In report to the city committee on public utilities the Beeler Organization recommends a single city-wide system including cars and buses. Elimination of competing bus lines is urged in order to permit improvement of service to all sections of the city at reasonable rates.	
Indiana Utilities Important Revenue Producers.....	1006
Improving Service on Long Suburban Loops.....	1006
"Collective Management" Works Well at Pittsburgh	1007
Representatives of trainmen make suggestions at joint monthly meetings with operating officials. Disposition is reported at next meeting. A summary is given of the October proceedings.	
Tulsa in 1907	1008
A Railway Enters the Homesteading Field.....	1009
Concord Electric Railways employs several interesting expedients in tackling the problems of small revenue, ruinous automobile competition, run down equipment and public insomnia. Conditions are now improving.	
Trucks Turned to Advantage by Ohio Interurban	1011
Maintenance Notes	1012
New Equipment Available	1014
Association News and Discussions.....	1015
Courage and New Equipment Accomplish Results in Grand Rapids.....	1015
By L. J. DE LAMARTER.	
Co-operation of the Transportation and Mechanical Departments	1016
By E. W. MILLER.	
Economic Situation of European Railways.....	1016
By L. BOULLE AND M. BOUTEAU.	
Barcelona Convention Attracts Large Attendance	1018
News of the Industry	1019
Recent Bus Developments	1024
Financial and Corporate	1025
Legal Notes	1028
Personal Mention	1029
Manufactures and the Markets	1030

Prompt Co-operation

WITHIN ten days from the date when letters were sent out by the JOURNAL requesting information for use in the Annual Statistical Number, replies were received from a large proportion of the companies addressed. The prompt co-operation thus given by the officials of more than 300 electric railways has facilitated the compilation of the figures showing the progress of the industry during the year.

Other replies are coming in by every mail, and before the issue goes to press, it is expected that comprehensive data will have been received from practically every active operating company. In previous years the published statistics have represented about 97 per cent of the industry.

Time is an important element, however. Properties which have not yet sent in their replies are urged to do so immediately. Promptness will help materially in assuring accuracy and completeness in the figures to be published Jan. 1, 1927—another chapter in the series of figures on which the industry has come to place great reliance.

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SAVING THE RAIL SAVES THE RAILWAY

Outwitting Old Age

“PROPER maintenance of equipment is one of the best selling forces an electric railway may employ. In the past ten years the transportation industry has witnessed the abandonment of many properties. Of these it is probable that a large number would still be in operation if proper attention had been given to their physical upkeep.

Take as evidence one representative property in New England. This small company last spring discontinued its operations when scarcely a vestige of public patronage remained. Evidence of erratic maintenance was on every hand, and it seems that this one item alone was sufficient to explain the steady decline in the company's fortunes.

The initial negligence lay in the condition of the track. More than one-fifth of the total mileage was laid in permanent pavement with 9-in. girder rail and steel ties set in concrete. The remaining roadbed was exposed 70-lb. rail on private right-of-way. The girder rail was eight years old, the tee rail was twenty. No money had been expended in maintaining the pavement and rail. Joints that could have been kept smooth were pounded down and the pavement had broken away beneath, allowing water to do its usual damage. Several hotel proprietors complained because guests were awakened early by the pounding of car wheels over these neglected joints. Finally the local hotel association, appealed to the state utility board and the cost of relaying with new girder rail was the strongest point in the argument presented by the company attorneys when abandonment was sought.”

Quoted from the leading editorial of the November 20th issue of this paper. To outwit old age, maintain the youth of your track.

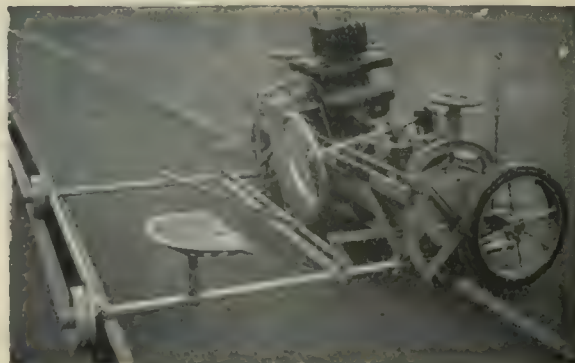
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1438



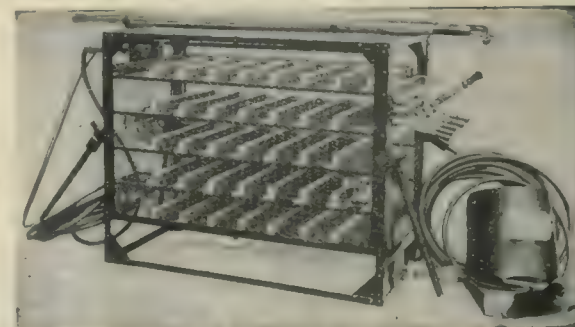
“Improved Atlas” Rail Grinder



“Imperial” Track Grinder



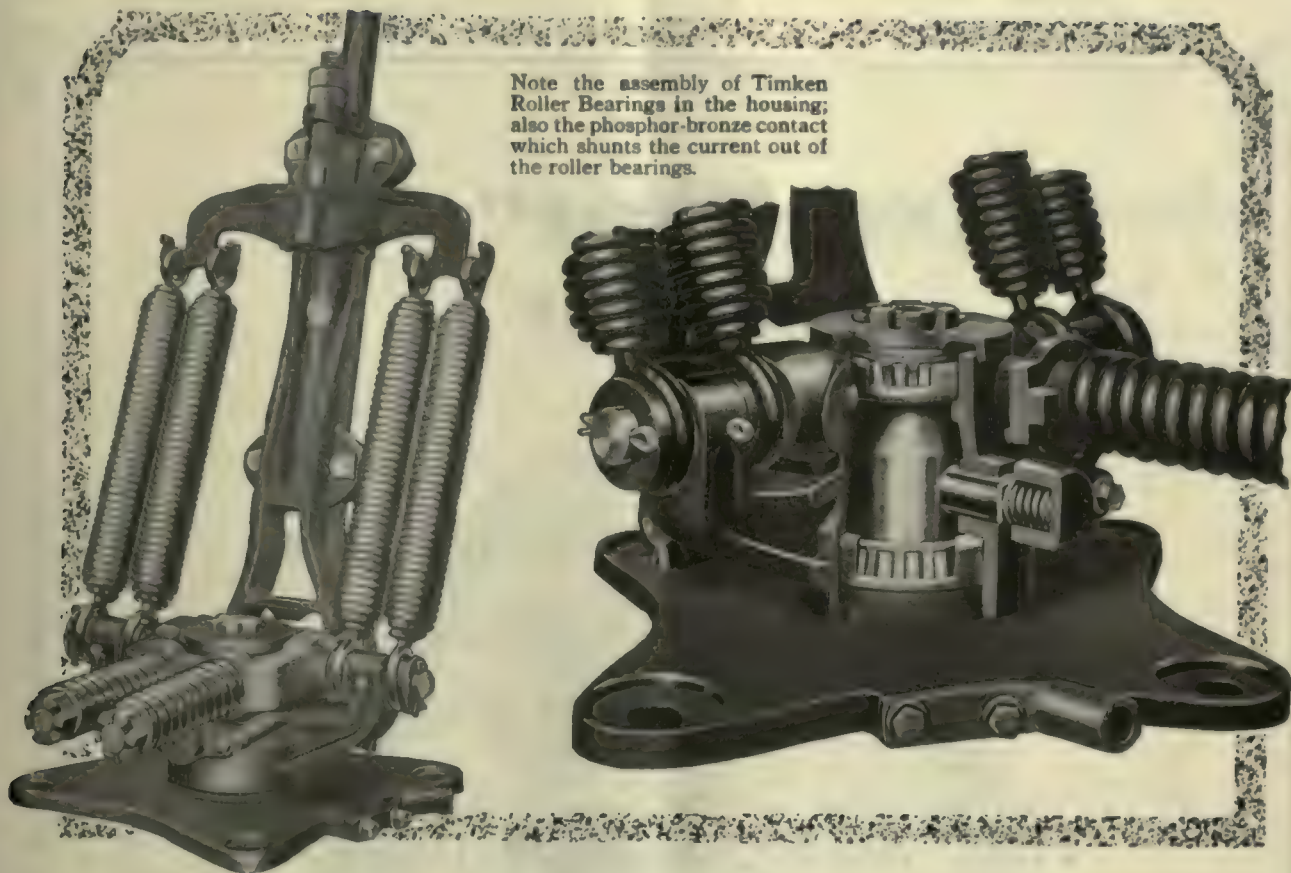
Reciprocating Track Grinder



“Ajax” Electric Arc Welder

SAVING THE RAIL SAVES THE RAILWAY

Note the assembly of Timken Roller Bearings in the housing; also the phosphor-bronze contact which shunts the current out of the roller bearings.



Free Trolley Pole Play—On Long-Life Timken Bearings



O-B Form 4 Base is ideal for city, interurban or freight service. It is compact, light in weight, and strong and durable in construction. Its special pedestal contact brush has ample capacity for operating a number of heavy freight cars in trains.

IN the O-B Form 4, the first two essentials of a trolley base, i. e. instant and easy response to every gradation and to every curve in the overhead, are secured by (1) a perfectly balanced spring assembly, and (2) a full-floating, Timken Tapered Roller Bearing mounting.

The third and fourth essentials, low maintenance and long life, have been attained by correct design, accurate machining and assembly, and the use of materials best suited for the service. A fifth and vital essential—a low resistance and reliable path for the current—is provided by a high-conductivity pedestal brush shunt.

The simplicity of the O-B Form 4 Base assembly is another important advantage which recommends its use. All parts are so accessible that inspections are easily and quickly made. To remove the base from its pedestal, it is only necessary to remove a cotter pin and cap nut.

May we send you complete details, including the names of users?

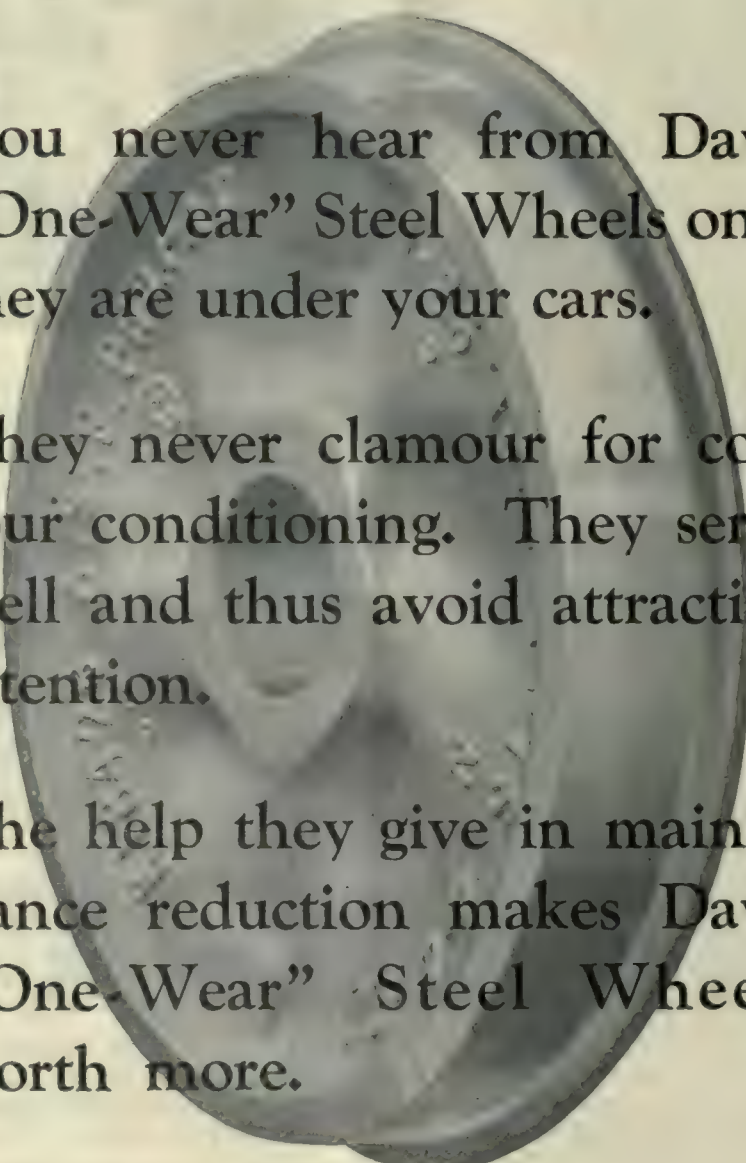
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"One-Wear"—No Repair



You never hear from Davis "One-Wear" Steel Wheels once they are under your cars.

They never clamour for contour conditioning. They serve well and thus avoid attracting attention.

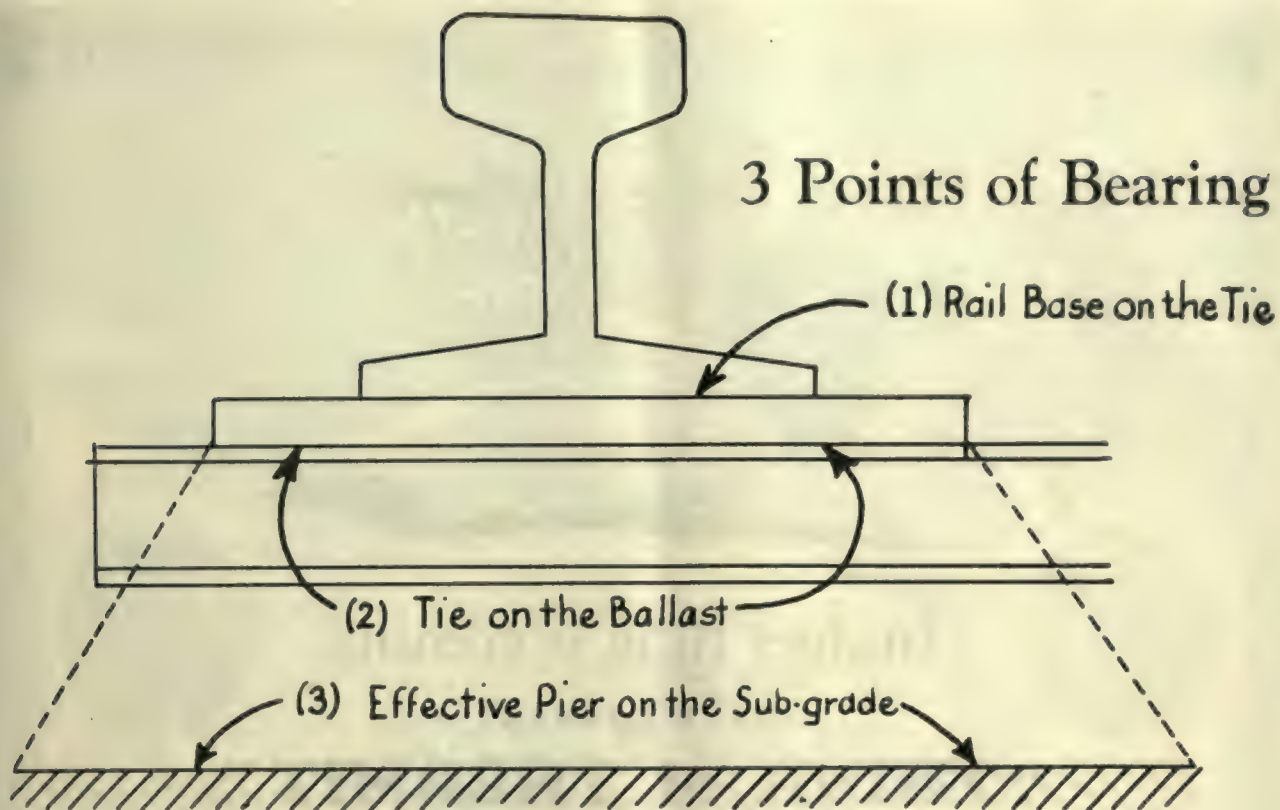
The help they give in maintenance reduction makes Davis "One-Wear" Steel Wheels worth more.

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Check These Three Bearing Points

STEEL Twin Ties are well known for their large effective bearing, a feature of their efficient design and the secret of the long life, low initial cost and success of this construction. Notice and use for comparison the actual figures of Twin Tie Bearing in the table on the right.

Twin Ties on 6'0" Centers	Square Inches
(1) Rail Base on Tie (assumed 6" base)	216 50% Rail Base Supported
(2) Tie on the Ballast	936
(3) Effective Pier on the Subgrade	2700

The International Steel Tie Company
Cleveland, Ohio

*Write today for catalog, detailed
cost figures from many installations and
delivered price on Twin Ties.*

Steel Twin Tie Track



Budget time is coming
and it's time to
“THINK of THERMIT”

Consider the rail joint problem—and the modern demand for smooth-riding track, quiet-riding track, long-wearing track.

Can you afford to temporize longer with anything less than a permanent weld? Can you be satisfied with less than a joint eliminating process in which “the first cost is the last cost”?

Thermit affords a permanent weld. It makes a continuous smooth-riding rail which causes no more costs for maintenance, after the original installation is made.

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Facts and figures on the widespread acceptance of Thermit Welding will be published in the January 1st issue of the ELECTRIC RAILWAY JOURNAL.



METAL & THERMIT CORPORATION
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setting sun —*

GOLDEN GLOW HEADLIGHTS

For electric
railway cars

For buses

During the day "Old Sol" supplies the light that makes for safe operation. At night Golden Glow Headlights assume this duty.

The Golden Glow beams easily penetrate through the dusk of twilight, the inky blackness of night, the mists of early dawn; through fog, rain, snow or smoke. Yet their intense light is non-blinding and non-dazzling because the greenish-yellow glass reflector alters the violet portion of the spectrum.

Ask for further particulars of Golden Glow Headlights—made in various styles and sizes for both cars and buses.



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Modern types of cars are as varied as the communities they serve. Single truck, double-truck—single end, double end—all have their place in handling the peculiar problems within their zones of operation. High cars, low cars—long cars, short cars—but all Safety Cars where the best interests of a community and a will to serve vividly and economically are given thought.



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*It is a Safety Car if equipped with
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*Dayton Ties
Put "Shock
Absorbers"
Under Your
Track*

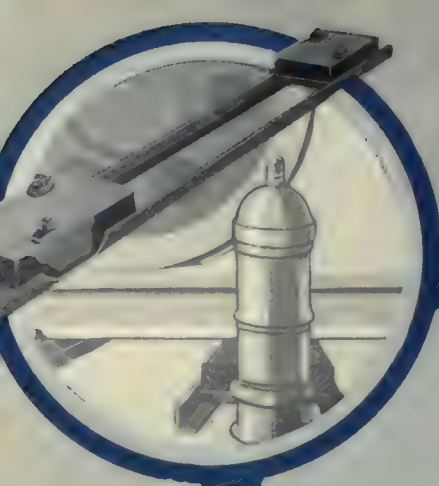
**You
have a neighbor
who is using
Dayton Ties**

**Hear what he says
about them**

*Send for information
on the nearest installation
to you — then see it*

**The Dayton Mechanical Tie Co.,
Dayton, Ohio.**





*Dayton Ties
Put "Shock
Absorbers"
Under Your
Track*

Enthusiasm of Dayton Tie Users Carries Conviction

With Dayton Mechanical Tie installations in 127 cities—with 80% or more of customers repeating—with our factory running night and day, making a tie every 20 seconds, we have evidence that our users are enthusiastic.

Officials of every property which has tried them are delighted with results. Why shouldn't they be? In the 15 years we have been making them, not a single piece of Dayton "Shock Absorber" track has worn out. This is a record not even approached by any other make of tie.

Let us tell you where there is a Dayton Tie Installation near you. Go and see it, and talk with the officials.

We'll leave it to them.

**The Dayton Mechanical Tie Co.,
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Indianapolis Street
Railway Company



OPERATORS find that automatic treadle operation of their exit doors has solved the traffic handling problem not only upon small-sized single-truck cars but on the largest size of double-truck cars used in city service. Automatic operation of the exit doors takes thought and labor from the man up front and frees him for his operating and his fare collecting duties. One man can, therefore, handle large-sized cars without adding to the standing time at stops or lowering the schedule speed of operation.

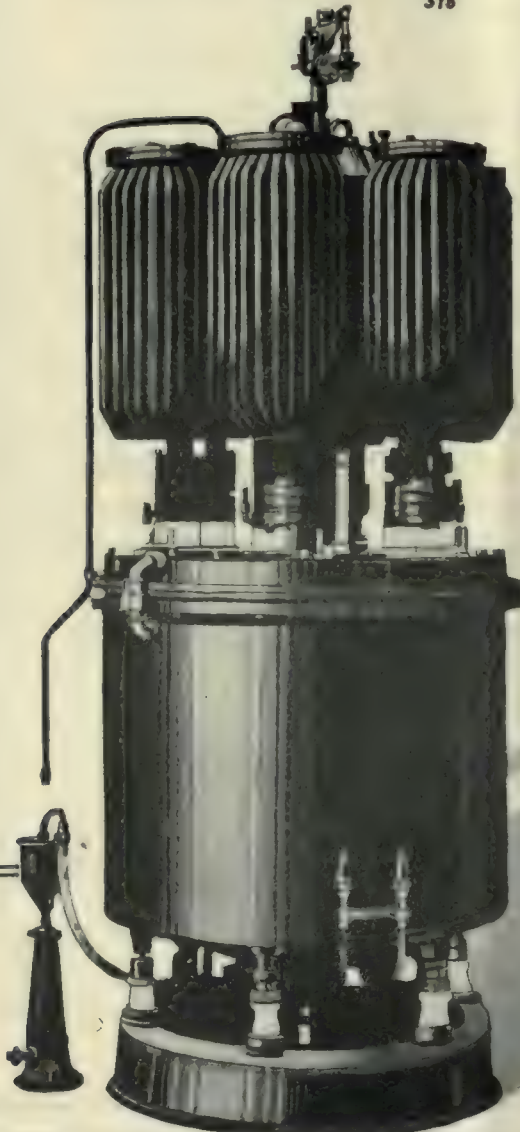
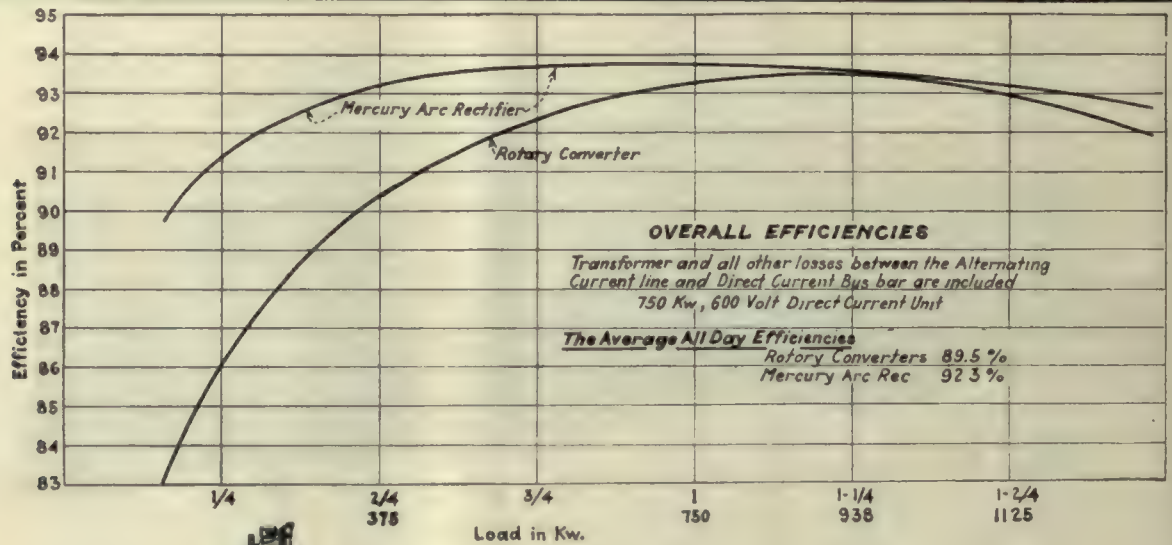
NATIONAL PNEUMATIC COMPANY

Executive Office, 50 Church Street, New York

General Works, Rahway, New Jersey

CHICAGO 518 McCormick Building MANUFACTURED IN TORONTO, CANADA BY 1010 Colonial Trust Building PHILADELPHIA
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Steel enclosed—
no glass parts



Mercury-Arc Power Rectifiers

8. Light Construction for New Substations!

With the use of mercury-arc power rectifiers savings in construction investment can be secured. In some cases even old houses can be converted, while the plant may often be erected in places that could not be considered for rotating machinery. In one case a 240 kw. set complete is now operating in the basement of a power company's show room. A feature of importance is that no foundations for vibrating loads are required, the only consideration in this respect being that the floor be level and strengthened sufficiently to support the dead weight which is only 200 lbs. per sq. ft.

*Descriptive Circular No. 301
describes ABB Mercury-Arc
Power Rectifiers*

Principal Products

Mercury-Arc Power Rectifiers
(steel enclosed)

Electric Locomotives—for any
system of current, high or
low tensions.

Complete equipment for rail-
way electrification

Rotary Converters

Motor Generators

Diesel-Electric Locomotives

Mining Locomotives

Switches, Controllers and all
Auxiliary Equipment

Automatic Regulators

Steam Turbo Generators for
normal or high pressures
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Relays

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Structural Steel Fabrication

Chief Advantages

1. Efficiency high over the whole working range.
2. Simple operation and minimum attention.
3. No synchronizing.
4. Very high momentary overload capacity and insensibility to short circuits.
5. Negligible maintenance.
6. Low weight. No special foundations.
7. Noiseless and vibrationless operation, consequently rectifier substations can be erected in densely populated localities.
8. New substations need only be of light construction. In many cases old houses can be converted, while the plant can often be erected in places that could not be considered for rotating machinery.

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Safeguard and Accelerate Traffic

Automatic Signals by providing proper spacing of cars or trains, reduce trip time and enable more cars to be operated with consequent safety.

Interlocking installations at terminals and at grade crossings eliminate unnecessary stops and assure route continuity by means of signal indications.

Highway crossing protective devices of the flashing light, automatic flagman, or audible type, or combination of same, are a dependable insurance which soon pays off the investment.

Power operated remotely controlled switches are being used economically to accelerate Electric Railway traffic.

These Systems are products of the



Union Switch & Signal Co.

SWISSVALE, PA.





Making each passenger his own brakeman!



Confer with our representative regarding the desirability of Westinghouse Variable Load Brakes for your new cars.

Each passenger boarding a car adds more weight to be controlled by the brakes.

If the ordinary air brake equipment is used, this additional weight will result in a longer stopping distance than when the car was empty—particularly if the car is of the modern light weight type. The longer stop reduces the schedule speed and slows up transportation service for the passenger.

If Westinghouse Variable Load Brakes are used, however, the weight added by each passenger entering the car does not remain uncontrolled, but is used to automatically adjust the brake mechanism so that a corresponding increase in retarding force is made to assure the same stopping distance as before his extra weight was added. Each passenger thus unknowingly helps to safeguard and expedite his journey.

This modern brake for modern cars makes for safer and faster transportation, because uniformly short stopping distances are assured by virtue of automatic adjustment of brake cylinder pressure as the passenger load changes.

WESTINGHOUSE TRACTION BRAKE CO.
General Office and Works, WILMERDING, PA.

WESTINGHOUSE TRACTION BRAKES

Remember—



A step ahead of the modern trend

you make no experiments

when your *New* cars are built
to the basic principle of

BALANCED DESIGN

The results have been specific and conclusive.

Balanced Lightweight New Cars have reduced operating expenses as much as 30%. They have been directly responsible for lifting companies, long in receivership, back onto a paying basis.

It has taken 10 years of consistent effort to establish the principles back of this success. And only by boldly breaking with precedent, in bringing both design and construction of Cincinnati New Cars directly under one experienced supervision, have they been applied to every detail of the completed car.

The result is a unique balance of

appearance, weight, speed and operating cost, to meet the specific requirements of any given service,—tending always to desirable uniformity of *performance*.

Thus in planning your new cars we start with a groundwork of proved principles rather than mere specifications. The results demonstrated in the operating statistics of roads now modernized with Cincinnati Balanced Lightweight New Cars can be duplicated with certainty. The formula is fixed. You make no experiments.

Detailed operating data and blue prints, or suggested plans for specific operations gladly furnished to interested railway executives on request.

THE CINCINNATI CAR COMPANY
CINCINNATI, OHIO

CINCINNATI
New
CARS



EFFECTIVE December 1, prices on General Electric railway motors and car equipments will be reduced approximately five per cent.

This reduction is made possible by the economy resulting from the consolidation of all railway manufacturing and engineering activities at the Erie plant of the Company.

It is an established policy of the General Electric Company that economies effected in engineering or manufacturing shall be reflected in the prices of the electrical product to the operating companies.

336-42

GENERAL ELECTRIC

Electric Railway Journal

Consolidation of Street Railway Journal and Electric Railway Review

Published by McGraw-Hill Publishing Company, Inc.

CHARLES GORDON, Editor

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New York, Saturday, December 4, 1926

Number 23

Plan Early for the Cleveland Convention

EACH year the advantages of fixing the location for the annual convention early in order that adequate plans can be made have been apparent to the industry. Each year, however, matters have been held back by necessary negotiations, and the time available for staging so extensive a show has always been far too short.

Thus the industry will welcome the action of the executive committee in deciding at this early date to go back to Cleveland. This gives to manufacturers and other exhibitors an opportunity such as has seldom been available before. There is now ample time to lay out plans far in advance and to undertake developments to be introduced at the convention.

Some manufacturers have questioned the advisability of the heavy expense incurred in exhibiting standard apparatus with which most of the industry is already familiar. In some cases such a question seems to be justified, although there are always younger men coming up in the operating companies to whom even such an exhibit is educational and valuable. But the fundamental object of an exhibit is to show new devices and developments. The introduction of anything new is always attended with a certain resistance on the part of conservative operators. A convention exhibit gives such men an opportunity of seeing first hand the new things that have been brought out. If the exhibit shows the apparatus in operation, so much the better.

Today there is a rare opportunity offered to electric railway manufacturers. Railway men are in search of new developments and improvements. Competition of other forms of transportation has brought about a keen demand for any product that will help to improve the character of railway service or to reduce the costs of operation. For that reason the traditional conservatism and resistance to new things have been replaced by an awakened interest.

In no class of equipment is this interest stronger than in the electric railway car itself. The industry is alert to the advantages of car improvement. New and better cars have proved to be an effective means of winning public friendship, employee co-operation, increased patronage and reducing operating costs. The industry is looking for such cars. It is ready to investigate any practical improvements which the builders have to offer.

But in this opportunity there is also a responsibility for the car builders. The time has come for them definitely to take the initiative. It will no longer suffice merely to stand in readiness to work out the customer's ideas. The price of recognized leadership is initiative and courage. The idea that railways will not buy cars worked out in detail and developed by the builder as a complete product is being rapidly dissipated. The builder who maintains the status of a contractor and refuses to take the lead in stimulating design improve-

ment may expect to lag behind in the march of progress. During the last year at least one car order was placed as the result of a comparison of sample cars submitted by several builders to demonstrate what they could offer in the way of improvement. The car exhibit at the next Cleveland convention will be a striking illustration of what the various builders have been doing during the year. Many car orders may be expected to be placed on the basis of what is shown there. Now is the time to work out new ideas. The Cleveland convention will be the place to show them. The nature of that exhibit will clearly indicate whether the industry has been moving forward or standing still during the year. Now is the time to plan for the next convention.

Valuable Ideas Developed Through Trainmen's Co-operation

SUCCESSFUL organizations fall into two classes, those in which one master mind dominates through will power and an amazing grasp of detail and those in which the management represents the collective brains of the personnel. The one-man organization corresponds to that type of government called a benevolent despotism. It is never attained; it just happens. When the despot dies, it is found that no one was trained to fill his shoes. The collective organization, on the contrary, is the fruit of careful upbuilding. It is not that kind of organization defined as "but the lengthened shadow of a man."

So much has been heard about one-man organizations that it is a relief to turn to one that has achieved success through the policy of bringing out every worker's individuality to the limit—where the ideal is to operate with the collective intelligence of all the staff instead of only a few at the top. This truly co-operative management is being sought by the Pittsburgh Railways by various means, of which the most important is probably the monthly meeting of its trainmen with the operating officials and department heads.

Staff meetings of foremen and department chiefs are not new. They have done much good. Their limitations are twofold, however: First, a small group of men soon runs out of live subjects; second, they do not touch bottom by bringing in the rank and file—the men on the platform who are in the first line of contact with the public. In the case of Pittsburgh, the company took the unusual step last February of securing this rank and file co-operation directly through the union representatives at the various car stations, and it has worked.

The union's spokesmen have found in this co-operation an enlarged importance for themselves and an enhanced appreciation of the part that the united intelligence of the trainmen can play in the operation of the property. As the recording secretary said at the

October meeting: "These sessions dispose of more troubles in a month than a business agent could settle in a year through the old channels."

The *modus operandi* is simplicity itself. Through their agents the men submit any suggestions which they believe will produce better conditions for themselves and for the riding public. These suggestions are assigned to the appropriate department head or joint committees, and at the following monthly meeting they submit their findings.

The October meeting, for example, disclosed that quite a number of suggestions made a month or two before were already in effect, and that others depended in a measure on the co-operation of municipal interests. The many complaints on hazards caused by parking, narrow streets and the like led to the formation of a committee of trainmen which will present traffic conditions as the motorman sees them to the Better Traffic Committee of Pittsburgh. The vivid interest displayed in safety questions led to the sending of a representative from each carhouse to a national safety convention.

That the trainmen also think of ride-selling and finance is shown by the suggestions concerning transfers, passes, splashing switches, hard-riding cars, additional shelters, better-located stops and so on. Unquestionably, the monthly statements of the company earnings, mileage output, usefulness in transportation and current state of the pocketbook have helped to increase this interest. These figures, read and elucidated by Vice-President Fitzgerald, go a long way toward making the men feel that they have a real stake in the property. The assumption that men do understand helps them to appreciate their work beyond the mere manipulation of the controller and ringing of the register.

A Concrete Example of Railway Starvation

WHILE much has been said and written regarding the ill effects of competition in transportation, it is usually in generalities. Seldom has there been a concrete case where the situation is brought out so clearly as in Canton, Ohio. The facts were presented to the municipal authorities of that city by the Beeler Organization in a report which is abstracted in this issue. In this report it is shown that the street railway system, which had a franchise to furnish transportation in the city, and which was required to furnish its service subject to stringent regulations of the City Council, had been given no protection against individuals who wanted to exploit the railway by providing competing bus service. It was of no avail that the company was willing to provide, and did provide, supplementary bus service where the rail service was deemed inadequate. The competing buses have been allowed to encroach in all parts of the city until they carry about 40 per cent of the riders.

As a result of the failure of the city to live up to its bargain, it is faced with complete failure of the railway company. For the last several years operating expenses have not been met. The service has deteriorated, the cars and the tracks have been allowed to fall into disrepair, principally because the owners of the system have no assurance whatever that further investment will be protected any better than in the past. If, as the report shows, the management of the property has failed

to be aggressive, such a condition can be understood.

That complete withdrawal of rail service and the substitution of buses would be uneconomical is shown in the report. It is estimated that the operating expenses of an all-bus system would be \$116,505 more each year than for the co-ordinated car and bus system which the company can give if permitted to do so. What the total cost of service would be in the two cases cannot be determined with accuracy, as it involves a valuation of the railway, for which figures are not available. It is estimated, however, that the city will save between \$1,500,000 and \$2,000,000 in the life of a 25-year franchise if the co-ordinated system is adopted, besides having superior service the while.

City and company representatives will do well to ponder this report. There are many cities of moderate size where conditions are not dissimilar to those in Canton, and where threats have been made against the existing transportation companies. In not a few competition has been allowed to flourish, with the inevitable decline in quality of service. Undoubtedly the consequences will be similar to those reached in Canton. By allowing the established system to develop, the transportation rendered will be superior to that where the starvation process ends in abandonment of service by the carrier best fitted to furnish it to the community.

Bus Membership Discretion May Well Rest in Executive Committee

A COMMITTEE has been appointed this year by President Sawyer to study the American Electric Railway Association constitution with a view to suggesting any changes which in the light of developments in the industry may seem desirable. The question of membership of independent bus operating companies is one of the specific matters under consideration.

At the present time the constitution permits membership of bus manufacturers but limits bus operating membership to subsidiaries of railway or railroad companies. Two years ago a similar question of broadening the membership requirements and changing the name of the association was under consideration, but was rejected. At that time the industry was hardly ready for the change. This was even more true when the subject was considered on the floor of the convention in 1921. Today, however, the number of electric railways which are operating buses is larger than those which do not do so, and the number of such buses and bus lines is constantly growing. In addition the situation has become complicated by the admission of bus manufacturers to membership, some of whom are bus operators as well as manufacturers. As the result of ownership of operating company financial paper, a number of those manufacturers who are not operators directly are indirectly, at least, very much involved in the operating side of the industry.

Under the present constitutional provisions membership is open to bus operating subsidiaries of steam railroads as well as of electric railways. Although such a situation would be deplorable and would not be in the best interest of sound transportation development, there are indications that competition may in some instances develop between such steam subsidiaries and electric railway bus operations on a scale which would prove every bit as destructive as has any

of that independent competition which grew up during the absence of regulation. The present constitution also permits retention of membership by bus operators who were at one time electric railway members, but who have since entirely substituted buses for their rail lines.

A peculiar situation exists in the case of the Fifth Avenue Coach Company in New York, which is not at present eligible to membership as an operating organization. Before this property was sold to its present owners by the Interborough Rapid Transit Company it would have been eligible to membership under the present constitution. Such a membership could probably have been retained even after the bus line was sold. Now, however, this company, not eligible to membership, has reversed the usual situation by entering into a contract to buy an actively operating electric railway member company; i.e., the New York Railways. In this case the bus company, instead of being the subsidiary, would become the parent company. Under the present wording of the constitution there is a question as to whether the parent company would be eligible to membership despite the fact that its subsidiary is an active member.

All this is merely by way of showing the need for careful study of the question of bus membership in the association. The present committee's work on the constitution is intended to suggest enabling changes. These would be so worded as to put into the hands of the executive committee the power to decide whether an independent bus applicant should or should not be admitted, instead of retaining a rigid constitutional bar to such consideration by the executive committee. It is obvious that the transportation industry is going through a critical period of readjustment. For that reason it seems wise to provide a certain degree of flexibility regarding membership requirements in the constitution, placing discretionary power in the hands of the executive committee.

It seems only reasonable, from the standpoint of fostering sound development of local transportation and of bringing about constructive co-operation, that unfortunate situations of the past and prejudices growing out of them be not permitted to stand in the way of expanding the association's activity in keeping with the needs of the times.

New York's Comptroller Insists Subway Policy Be Stated

COMPTROLLER BERRY of New York City is a recalcitrant, not just for the sake of recalcitrancy but to a good end. He can't quite see where New York is headed on its present subway policy—if its attitude may be so dignified—and he wants to know from his colleagues in the city administration just what it is all about.

Tammany, of course, slid Mr. Walker into the office of Mayor after it had pinned the responsibility for delay in subway relief measures upon former Mayor Hylan. Mr. Berry, who went into office at the same time as did Mr. Walker, is an independent—extremely independent. He can't see any great difference between the Hylan and the Walker subway policies except that Hylan bragged about his inaction while Walker, who welcomes queens and prizefighters felicitously and passes over to

them the keys of the city, has done nothing more about subways than to promise to confide in the public at some time later on.

On the other hand Mr. Berry has sat down with the problem and determined that the system now under construction in New York may cost \$1,000,000,000 instead of \$500,000,000 or \$600,000,000. That sum may be a song or even a waltz to Walker, but it is something entirely different to Mr. Berry. And he wants to know. He insists upon knowing. In the eyes of Mayor Walker Mr. Berry may appear as a replica of the Bull of Bashan, but to the public of New York City he may prove their subway savior. Among other things, Mr. Berry wants to know: How is the great undertaking to be paid for? Is the plan adopted "the best for the entire city?" How is the system to be operated? These are questions that cannot be answered in strains of a waltz step, expertly negotiated, or by an aphorism. Mr. Berry realizes it, but Mayor Walker has given no evidence that he does. Shadow boxing doesn't qualify men to tackle problems like this one. There seems little need to express the wish that Mr. Berry will persist in his pursuit that something tangible be done.

Federal Judges' Salary Bill Deserves Support of the Industry

PRESENT salaries of district judges, \$7,500, and of circuit judges, \$8,500, are so inadequate, particularly in the larger cities, that there is general dissatisfaction among the incumbents, not to mention a feeling of injustice. A number of the judges have resigned, and not a few are merely holding on until they determine whether the situation will be bettered.

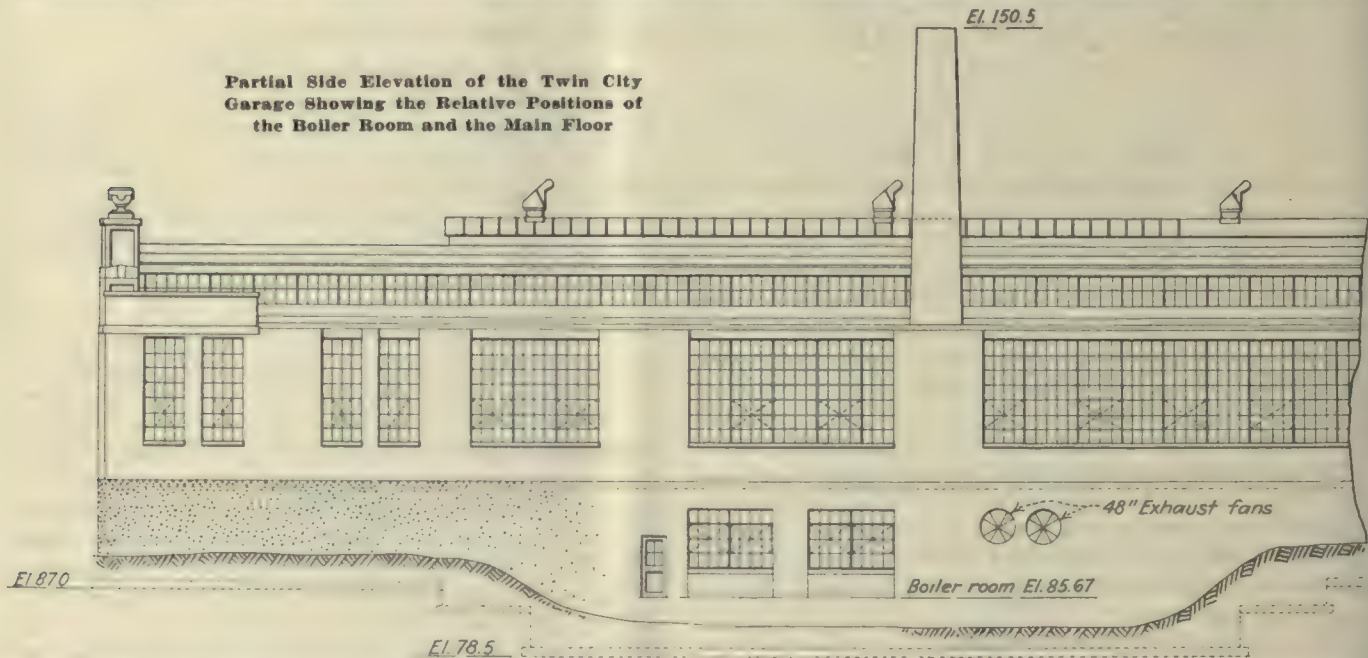
In order to relieve the situation, a bill increasing the salaries of district judges to \$10,000 and of circuit judges to \$12,500, with corresponding increases for other federal judges, was introduced in and has passed the Senate. It is definitely set for a vote in the House of Representatives on Dec. 9. The American Engineering Council and its constituent engineering societies have been vigorously supporting the bill in both houses of Congress, and have been represented before a number of congressional committee meetings. The passage of the bill deeply concerns not only the welfare of the country in general, but it is of special import to those industries, such as the electric railways, which frequently have technical problems like valuations and franchise matters before the federal courts. Much unnecessary litigation has resulted from failure of the courts to interpret correctly matters of this sort, and any lowering of the standard of the judiciary will make the danger of this still greater.

As to the justice of the proposal for increasing salaries there can be no argument. It is grossly unfair to have invited capable lawyers to give up profitable practice and take appointments to one or another of the federal courts in days past, when the salary afforded a comfortable and dignified living, and then, when the cost of living goes up, not to increase the salaries at least proportionately. It is poor business, because the judges cannot do their best work when they have difficulty in making both ends meet and maintain the standard which the dignity of the position demands.

The bill should be passed if the quality of the federal judiciary is to be maintained.



Architectural Details of the Twin City Rapid Transit Garage Combine to Make a Pleasing Appearance. The Building Frontage Is 135 Ft.



A Clear Area of 100 Ft. x 300 Ft., the Main Part of the Garage, Is Free of Supporting Columns. Extending Lengthwise Down the Floor Is a Grating Under Which Is a 6 x 6-Ft. Ventilating Duct Connected with Two Exhaust Fans



One Corner of the Main Garage, Shut Off by Heavy Canvas Curtains, Has Been Set Aside as a Paint Shop. This Room Is Heated by the Steam Radiators Seen Against the Back Wall and Is Equipped with an Exhaust Fan Mounted in One of the Window Sashes

Well-Equipped Garage

Added to the Twin City Rapid Transit System

BUILT new from the ground up along modern lines is the new garage for housing and maintaining bus equipment of the Twin City Rapid Transit Company of Minneapolis and St. Paul, Minn. The building, constructed of steel and concrete, is finished in a pleasing manner with pressed brick facing and stone trim. It has a depth of 300 ft. and a total width of street frontage of 135 ft., being sufficient in size to house 100 buses and still leave room for the ordinary servicing and repair of the equipment.

Besides building a centralized bus repair shop it was the intention to create an operating division for the bus men comparable with the six well-equipped car stations which are located in the Twin Cities. Included are a locker room, bus men's quarters, cashier booth, office and similar facilities that are necessary to an operating station.

In this construction, and the accompanying establishment of bus service on the same high plane on which electric cars have been operated for years in the Twin Cities, is seen one of the important steps that generally mark the operation of such vehicles by established carriers rather than independents. The bus operations recently taken over by the electric railway interests comprise virtually all the intercity service between St. Paul and Minneapolis. For about ten years this service had been operated by independents. In addition several local

New Structure at Minneapolis to House 100 Buses Is an Operating Unit as Well as a Repair Shop and Storage Room—Particular Attention Has Been Given to Heating and Ventilating—New Machine Tool Equipment Has Been Installed—Building Was Designed and Constructed by the Austin Company of Cleveland, Ohio

lines are being established in the city of Minneapolis.

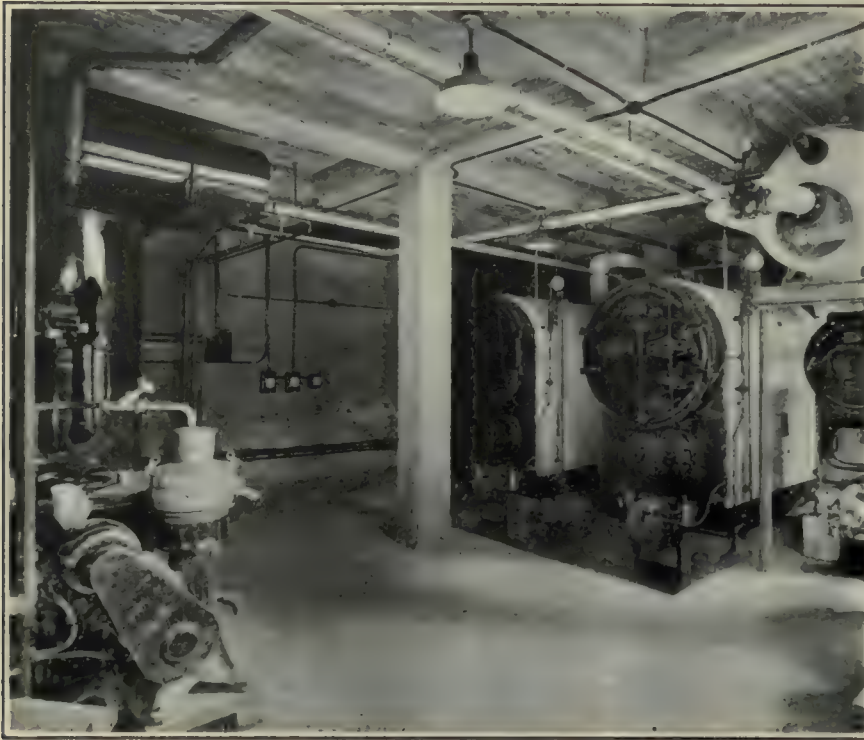
The garage is located but a short distance from the downtown center of Minneapolis, yet on a street so situated that it will not likely be congested with automobile or trucking traffic. The property on which the building is located is also adjacent to a switching spur, so that supplies in carload lots can be received. After the company officials

decided upon the general location, type and general specifications of the bus station, the Austin Company of Cleveland, Ohio, was chosen to plan the detailed layout and construct the building.

Height clearances of 15 ft. are maintained over the entire operating floor. The main portion of the building, having a width of 100 ft., is spanned with steel roof trusses, leaving the area below free of columns. To one side of the building is a 35-ft. bay that is used for shops and storage, except at one end, which is partitioned off for a store room, office, bus men's quarters, etc.

The roof deck consists of 2-in. x 6-in. yellow pine sheathing over purlins with a four-ply built up tar and gravel roof. The floor consists of a 6-in. reinforced concrete slab trowel finished, the surface of which has been treated with three coats of Lapidolith hardener.

Because of the severe cold of Minnesota winters, particular attention was given to heating and ventilat-



Below the Main Garage Floor Is the Boiler Room. Two Low-Pressure Steam Boilers in the Center Are for Heating the Building

The boiler partially showing at the right supplies hot water to the building and for washing automobiles and buses. All are oil fired. At the left is the oil reclaiming equipment with a De Laval separator in front and the dirty oil and reclaimed oil storage tanks behind and against the roof.

ing. The floor has a slope from each side of the building toward the center of 6 in. Through the center of the building runs a 6-ft. x 6-ft. duct for ventilation and drainage. This is covered over the top with subway gratings. This duct leads to a foul air chamber near the boiler room, in which are installed two 48-in. Ventura type disk ventilating fans, each having a free air delivery of 16,000 cu.ft. per minute. Foul air and exhaust gases are thus drawn off the floor and to the outside through this duct, as are also waste water, dust

and dirt that find their way into the central duct.

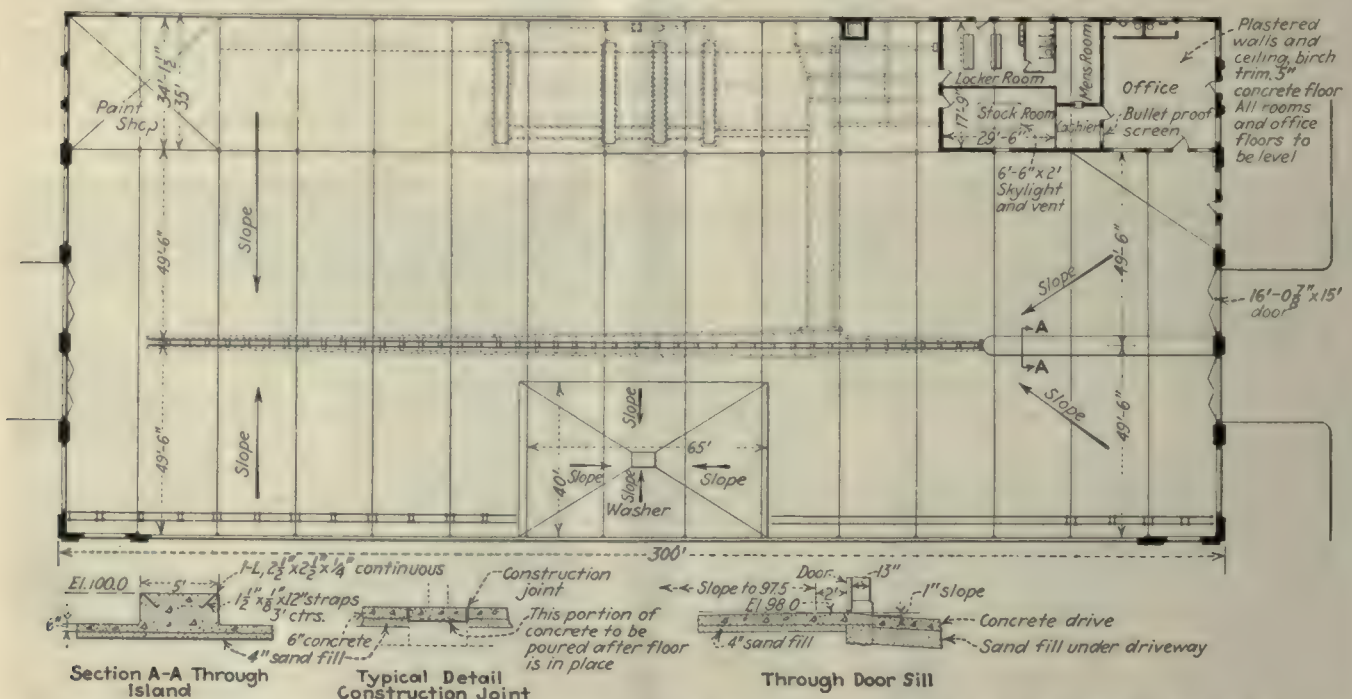
Repair pits are separately ventilated with a No. 2 Sirocco utility fan. Arrangements for heating and supplying fresh air to the repair pits have also been made.

Two low-pressure boilers, fired by fuel oil, are located in the basement and supply heat for the building. In the garage section four Venturafin unit heaters warm the air in the room through recirculating boxes heated by steam. With this system the air is heated by a recirculating process, drawing a variable amount of fresh air from the outside as desired. Heating capacity is available to maintain the interior of the garage at 45 deg. F. by recirculation when the outside temperature is 25 deg. below zero.

Inclosed rooms, such as the office, bus men's room, etc., are heated by direct steam radiation and are designed for maintaining 65 deg. under the above minimum outside temperature. A third boiler, which is also fired by oil, is arranged to supply hot water to the building and also for washing the buses.

The entire heating plant is placed below the level of the floor, as shown in the partial side elevation of the building, thus making possible gravity return for the condensed water. Fuel oil for furnace use is received in carload lots. It is pumped from the tank cars to a 17,000-gal. tank buried below the floor of the building near the boiler room.

A steam pipe is run inside of the fuel oil pipe for heating the oil in cold weather and for supplying steam necessary in unloading the fuel oil tank cars in winter.



Floor Plan of the Twin City Rapid Transit Company's New Garage in Minneapolis. A Space 100 Ft. in Width by 300 Ft. in Length Is Clear of Supporting Columns. In Addition a 35-Ft. Wing the Full Length of the Building Is Used for Storage and Repairs

The entire building is protected against fire by a standard sprinkler installation, the construction of which can be noted in a number of the interior views.

Illumination is provided by 200-watt lamps mounted in white enameled reflectors suspended from the roof at the level of the bottom chords of the roof trusses. These units are spaced 20 ft. apart one way by 25 ft. the other.

Space is provided for washing four buses at one time on the area of the main floor designed as a wash rack. The concrete floor in this section has a slope of 8 in. from all sides toward the center drain. A U. S. four-gun washer equipment has been installed.

A portion of the garage building, 40 ft. x 35 ft., as shown in one of the illustrations, is closed off by heavy canvas drop curtains to form a paint shop. In this room steam radiators are installed for additional heat in winter and a ventilating fan mounted in one of the sash carries off the paint fumes.

Gasoline, purchased in carload lots, is stored in two 17,000-gal. tanks, which are buried 4 ft. underground immediately adjacent to the railroad siding. Both the siding and tanks are considerably below the floor level of the garage and the gasoline, after being unloaded into the storage tanks, either by gravity or by pumping from the dome of the tank car, is again pumped to the garage floor as actually used. The pump house for handling gasoline and fuel oil is located adjacent to the railroad spur and contains two gasoline and one fuel oil pumps.

Inside the main garage building is a raised concrete platform 8 in. high, 5 ft. wide and 60 ft. long, on which

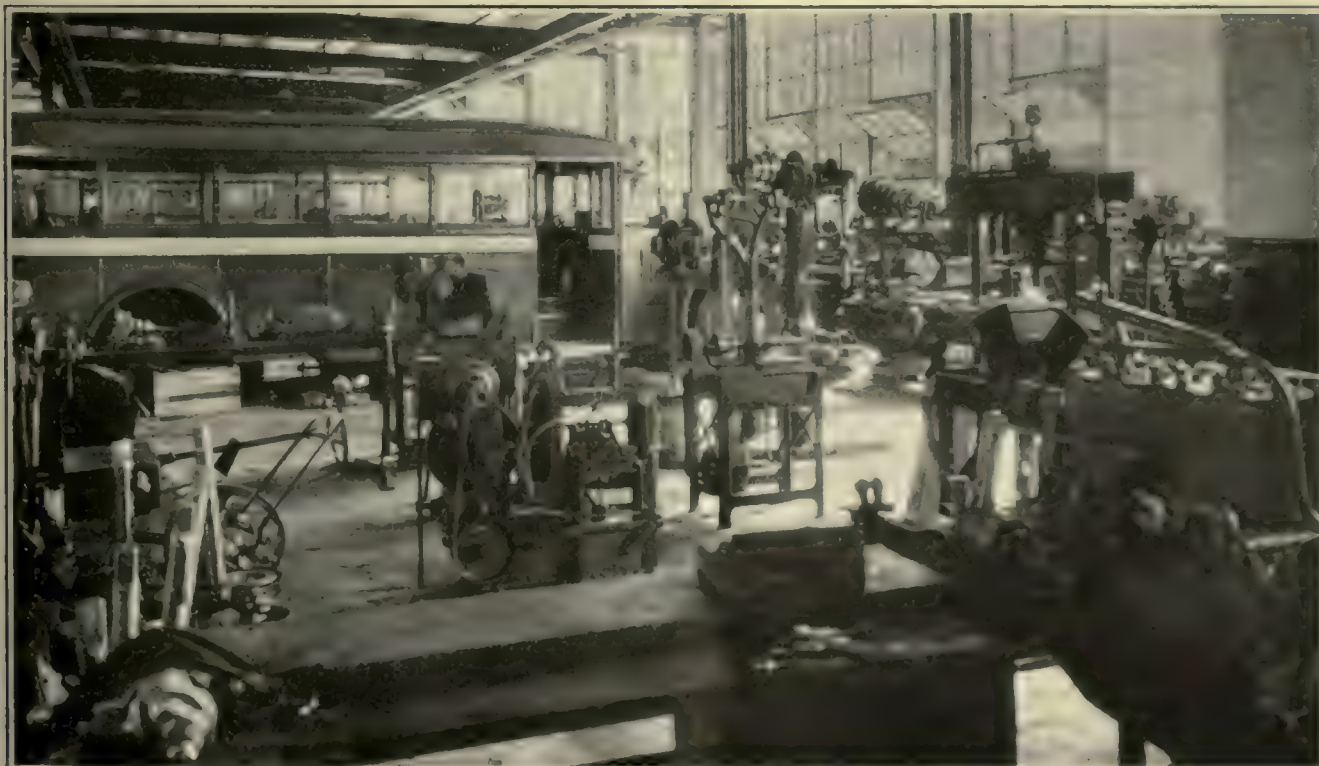


At the Rear of the Main Room of the Twin City Rapid Transit Garage Is a Raised Platform on Which Are Mounted Two Gasoline Filling Pumps, Engine Oil Containers, Waste Cans, etc.

The buses leave the garage through the rear doorway, receiving a supply of gas and oil as they pass by this station

are mounted two gasoline-filling units, lubricating oil containers and radiator water fillers. The gasoline fillers have spring valves, which, when held against a spring button, automatically start up the gasoline pumps, allowing the bus tanks to be filled. When the handle is turned off the valve is closed and the pump is shut down, permitting the gasoline in the filling hose and pipe to run back into the main storage tank. This latter was a requirement on the part of the city of Minneapolis.

Arrangements have been made for reclaiming lubricating oil used in engine crankcases by means of a DeLaval oil reclaiming set, illustrated in one of the views, which is installed in the boiler room. When the buses are drained the dirty oil is run into one of the three compartments in the dirty oil storage tank, depending on the kind of oil that had been supplied to the bus. The oil is then drawn by a pump through the reclaiming



A Corner in the Repair Shop Showing the Machine Tools and Testing Equipment

Machine Shop Well Equipped with Individual Drive Tools

- 1 Manley hydraulic press.
- 1 No. 901 Manley tire changer.
- 1 Manley combination brake relining machine.
- 1 36-in. Crescent motor-driven band saw.
- 1 No. 388-C 15-in. x 6-ft. bed South Bend engine lathe.
- 1 No. 398 24-in. x 8-ft. bed South Bend quick change gear gap engine lathe.
- 1 10-in. Stecher high-speed drilling machine.
- 1 6 x 6 Pearlless Universal sawing machine.
- 1 Black & Decker electric valve refacer.
- 1 3-hp. Black & Decker electric grinder, equipped with two 12 x 12-in. grinding wheels.
- 1 No. 2-A, 4,000-lb. Detroit type H electric hoist, 3½-hp. motor, 15-ft. lift.
- 1 21-in. Cincinnati Blackford upright drilling machine.
- 1 Model 55 constant potential battery charger, 100 amp., 7.5 volts, manufactured by Weidenhoff Company, with test bench, lathe with bench attachments; armature Test-O-Meter, under-cutter with lathe attachments; Bull Dog magnet recharger.
- 1 5½ x 5-in. water-cooled air compressor.
- 1 U. S. Model AW-4 four-gun electric car washer.
- 1 Grayco high-pressure (4,000 lb.) grease outfit.
- 1 Tokehim portable pneumatic oil transfer (12-gal. tank) with pump and hose (for changing oil at grease pits).
- 1 Bos model two-barrel grease pump, with hose and barrel truck.
- 3 Bos model 80 lubricator units, each with 60-gal. tank, drip accumulator.
- 1 Barrel truck and hand barrel pump with hose.
- 1 Toledo trip scale.
- 5 Super-Weld portable benches.
- 1 International time recorder (daily dial).

set, whence it is pumped into one of three 100-gal. storage tanks fastened to the ceiling of the boiler room. The reclaimed oil is then pumped directly to a filling hose located over the lubricating oil storage tank on the platform in the bus garage. In this way oil is drained from the buses, reclaimed and put back into lubricating oil tanks without handling in buckets or drums.

It is planned to handle all inspection and maintenance work in the machine shop section. This shop is well provided with individual drive machine tools, as shown in an accompanying view and the list of equipment tabulated elsewhere.

It is thus seen that the garage is well equipped not only to handle the buses of the company from an operating standpoint but to maintain them in excellent condition.

Bank Finds Chicago Electric Railways' Progress Remarkable

Northern Trust Company Recommends that Any Doubters About Essentiality of Electric Railways Should Study Local Roads

THE growth of electric railways in the Greater Chicago district in the face of tremendous increases in the use of private automobiles and buses and higher costs of operation is regarded as "little short of miraculous" by one of the largest banking houses in the great midland financial center.

A recent issue of "Bond Briefs," a bulletin published weekly by the bond department of the Northern Trust Company of Chicago, makes the following pointed observations:

The progress of the electric railways of the Chicago district in this typical period is little short of miraculous. In 1915 the three electric interurban railroads which enter the Chicago Loop (the Chicago, North Shore & Milwaukee, Chicago, Aurora & Elgin and Chicago, South Shore & South Bend Railroads) carried 13,004,588 revenue passengers. By 1925 this number had grown to 26,474,522, or an increase of more than 100 per cent, a rate of growth considerably in excess of the rate of increase in the population of the Chicago territory.

The comparison of the 15 per cent national growth with

the 100 per cent increase in Chicago naturally leads to the question, "Why is the rate of increase in the Chicago district so far ahead of the rest of the country?"

The answer, of course, lies partly in the tremendous development of the Chicago suburban districts, which has increased correspondingly the number of potential customers, but much of this demand might have been lost to bus lines or other competitors if it had not been for the progressive policy of the electric railways of this territory. This policy has been expressed by one of these companies, as follows: "It is our obligation to provide the kind of transportation the public wants, regardless of what the variety may be, and not merely to give service of a character which may be the easiest way."

Tangible evidences of this policy may be noted in the introduction of limited as well as express and local trains, the operation of dining and observation cars, the use of monthly commutation tickets, the operation of bus services co-ordinating with the electric services, the connections with the elevated trains in the Loop and freight, merchandise dispatch and the newly introduced refrigerator car service.

The bulletin remarks favorably on the practice of the North Shore Line of consulting with riders on various matters of service, calling particular attention to the contest held last summer for the selection of names for the nine new stations on the Skokie Valley line. The custom of the Chicago, Aurora & Elgin line of sending personal letters of welcome to all people purchasing commutation tickets who had not purchased such tickets in the preceding month was also highly praised by the bank.

The bulletin then proceeds to discuss the matter of expenditure made in improving the physical properties. Thus it says:

The electric railways of the district have also spent substantial sums in improving their properties. The North Shore Line, for example, had a valuation of \$12,251,977 in 1916. Since then, to the end of 1925, more than \$22,000,000 was spent on right-of-way, track improvement, stations, cars and other equipment, bringing the value of the road above \$34,000,000. The Aurora & Elgin and the South Shore Line have invested extensively in a rehabilitation program, including rock-ballasting, renewal of ties and rails, installation of wigwag and flash signals at crossings (necessitated by the great increase in automobile traffic) and a modern comprehensive system of block signal control.

Another interesting step on the part of the electric railways serving this territory, says the bulletin, has been their success in creating traffic by stimulating the upbuilding of the territory which is adjacent to their lines. In conclusion, the bulletin adds:

The success which these three electric railways have enjoyed under progressive management is an indication of the possibilities of electric railways. The series of failures which followed the first great era of traction development from 1897 to 1907 has given a wrong impression that this type of transportation is not economically sound. These early failures, however, were due to three causes:

1. The construction of roads not justified by traffic demands.
2. Extravagance and waste in construction, often for the benefit of the promoter, and usually resulting in over-capitalization.
3. Poor management.

From its own study of the situation which affects such properties the bank is led to conclude that the future of the interurban railway, intensively run, is secure. It says:

Experience in the Chicago district has shown that a well-constructed electric railway operating between two centers, or from an important city to its suburbs, if progressively managed, can provide excellent service to its passengers and a fair profit to its owners. Any one who has doubts as to the future of the interurban railroad business need only study the situation in Chicago to see what great possibilities lie in this field.

Co-ordinated Service Recommended for Canton, Ohio

In Report to City Committee on Public Utilities the Beeler Organization Recommends a Single City-wide System Including Cars and Buses—Elimination of Competing Bus Lines Is Urged in Order to Permit Improvement of Service to All Sections of the City at Reasonable Cost

CO-ORDINATION of all rail and bus lines in a single system to be operated by the present railway company is the outstanding feature of a report on transportation facilities in Canton, Ohio, recently made to the committee on public utilities of the City Council by the Beeler Organization, engineers and consultants, New York City. The unsatisfactory results and excessive cost of the present dual service are pointed out and detailed plans for the co-ordinated service are given. The report proposes the retention of the greater part of the street railway trackage, but in the interests of economy and improved service, consolidation of many of the bus routes is considered desirable.

Following is a brief abstract of the report, which consists of 94 pages of text and 123 pages of exhibits.

Until 1923 all of the service in Canton was furnished by the electric street railway. During that year rail service was supplemented by buses. This system, a division of the Northern Ohio Power & Light Company, operates four car lines and five bus lines. The rate of fare is 6 cents cash or six tokens for 35 cents. There is a universal free transfer privilege between all its cars and buses. In all the railway has 29.85 miles of track in the city, of which 22.2 is in active city operation. The railway owns 74 passenger cars, 47 being in fair condition and more than adequate for the present maximum week-day requirements of 33 cars. The company operates fifteen buses in city service. The equipment consists of six Reos and three Whites, which probably will not give more than another year of service, and six Six-Wheel buses, which have just been placed in operation.

A complete field survey was made of the local transportation lines, including all-day passenger counts at or near points of peak load for each car line and bus line, counts of parked cars, a study of the routing of interurban cars and buses, and inspection of shops, carhouses, garage and other facilities.

Canton, the county seat of Stark County, has had a steady growth, but its expansion has been greatest in

the present century, since the automotive industry began, which consumes a large number of Canton's products. The population in 1920 was 87,091 and in 1925 it had increased to 106,260, a 22 per cent growth. At the present rate of increase there will be a population of about 115,000 by Jan. 1, 1927.

Canton has an extensive business or retail shopping district. The city has a wide range of industries, manufacturing nationally-known products. Excellent trans-

portation facilities are available for bringing in raw materials and the distribution of the finished product. Nine leading plants employ some 11,000 workers. Plans are under way which would require 1,700 additional workers.

Canton's streets are uniformly level and well paved. Roadways vary in width and average about 40 ft. Street cars and buses in passing occupy about 20 ft., or 50 per cent of the roadway of transportation arteries. This leaves 10 ft. clearance on each side of the transportation lane for vehicular traffic. Ample street space is available for the fast, free movement of all classes of vehicles when the progress of traffic is not interfered with by the parking of automobiles.

Most of Canton's streets were constructed before the extensive use of the automo-

bile. At that time it was not intended that any part of the public thoroughfare would be used for storage purposes. During the days of horse-drawn traffic ordinances prohibited hitching of horses in city streets. Horse-drawn vehicles have been superseded by the automobile and hitching yards have disappeared. Storing of automobiles absorbs a large part of the street and slowing down of traffic has resulted in congestion.

Widening the roadways is suggested as a remedy to relieve the ever increasing congestion. In order to bring this about, very often the width of the sidewalk is reduced. Diminishing the sidewalk space that has been dedicated for ages for the sole use of pedestrians will add to the confusion.

It has long been a misdemeanor to use sidewalks for storage purposes. City authorities prohibit their use for display stands or other obstructions that will in

Four Principles of Co-ordination

1. Electric street railway transportation will provide the most economical, adequate, reliable and satisfactory service through congested districts where the density of traffic is the controlling factor and demands the use of equipment with large carrying capacity per vehicle.

2. Buses will care for traffic where the demands for transportation are moderate and without violent fluctuations.

3. Such a co-ordinated system will enable the patron to complete a journey from any point in the city to any other point on the payment of one fare.

4. With a system under one responsible management, the city of Canton will be in the position of enforcing all just and reasonable requirements as to present and future needs and of securing service.

—JOHN A. BEELER.

any way interfere with free movement of the pedestrian. Any attempt to change this practice no doubt would bring a storm of protest from pedestrians and merchants. If the reasons advanced for prohibiting interference of sidewalk traffic are sound, then the interference with street traffic should be considered in much the same light.

Use of the family automobile has educated not only the owner of the vehicle but also the traveling public to view the local city service in the same light as the individual service offered by the private auto. Prospective customers become impatient if compelled to wait for several minutes on the city service. Failure to provide a seat for each patron irritates the customer. If the vehicle is poorly ventilated, badly lighted and dirty, the customer's impression of the service is anything but complimentary. Recognition of the private automobile as a keen competitor is no secret. Decreased revenue has resulted from its extensive use, not only through the loss of patronage of the owners, but also through the owner's generosity in picking up prospective customers.

The average fare charged per trip for local city service is less than the cost of private service. Ordinarily cost will influence patronage, but cost in this case is not treated seriously. Desire of the public to ride on rubber is advanced to explain shrinkage of rail traffic. The real causes are the individuality and time-saving of the automobile. There is every reason to believe that its use will grow. The point of saturation is in the far distance. Automobiles will continue to offer keen competition to the city system, regardless of the character of equipment used in its operation or the personnel.

There is no city registration, but figures for Stark County, together with an allocation for the city of Canton on the basis of the United States census population of 1920, should give a fair indication of the number of motor vehicles in use. These figures for the years 1917 to 1925 follow:

Year	Passenger Vehicles, City of Canton
1917	5,170
1918	6,790
1919	8,350
1920	8,460
1921	9,990
1922	12,010
1923	14,730
1924	18,220
1925	19,850

This tabulation shows that there are four times as many vehicles in use as there were eight years ago, or their use has doubled every four years until in 1925 there was a passenger automobile for every 5.35 persons. Probably 23,000 cars will be in use in Canton with the coming of the year 1927.

Counts show that some 3,000 cars are parked daily in the downtown district and in the vicinity of the principal industrial plants. Checks made indicate that each vehicle carries an average of about two passengers. This would be some 12,000 rides daily or about 3,600,000 for a 300-day year. These are passengers that otherwise would be car or bus riders.

RAIL SERVICE AND REVENUE HAVE FALLEN OFF

All four rail lines are operated on ten-minute base headways, with additional service on two of them during the rush hours. This service requires 24 cars during the normal hours and 33 during the evening rush.

TABLE I—SERVICE AND REVENUE, CANTON CITY STREET CAR LINES OF NORTHERN OHIO POWER & LIGHT COMPANY

Year	Car-Miles	Car-Hours	Passengers		Passenger Revenue
			Revenue	Transfer	
1923	2,311,160	287,219	12,652,855	2,232,188	\$754,495
1924	2,119,992	264,702	11,273,039	1,828,477	674,158
1925	1,758,956	224,874	9,917,301	1,653,620	593,112
1926*	1,611,896	211,061	7,172,939	1,075,547	429,419

* Last six months estimated.

Table I shows that the service and revenue have fallen off in the past four years. This is true of all lines, being especially marked this year because of the strike of street car operators between May 2 and 22. At that time considerable car riding was lost which has not been regained.

One great handicap to the railway service is its low speed of 7.75 car-miles per car-hour. The speed between terminals is only 8.51 m.p.h. Such speed encourages the use of automobiles, and of buses that make 11 m.p.h. The factors that bring about this low speed are waiting at turnouts on single track, making passenger stops on a single-track section where there is a car waiting on double track a few hundred feet away, the use of single-track connecting curves so that the operator must go to the curb to switch a signal light, waiting for change with a fare rate that requires the use of odd cents, and the poor condition of much of the track. Such delays in a city with wide streets, and where vehicle congestion is not serious, not only annoy patrons but also are very expensive. The lines operating over single track are losing an average of from six to seven minutes per round trip in waiting on sidings. If the time in slowing down for sidings is considered, it can be seen that it is taking an extra car on each of these lines to care for the loss in time resulting from the use of single track.

There is a great excess of seats supplied over the demand during most of the day. The industrial lines have marked peaks, which the street cars with their large capacity care for very well, so that little additional service is needed. The opening and closing hours of some of the larger plants are staggered for the various shifts, which makes it somewhat easier to supply them with transportation.

BUSES OPERATED UNDER YEARLY PERMITS

The bus routes of the company are not operated under its rail franchise, but under yearly permits, as are the independent bus lines. The bus-miles, bus-hours, passengers carried and passenger revenue are shown in Table II. There has been a steady improvement in all but one line this year. The exception is doubtless due to direct competition by independent buses over a considerable portion of its route.

The principal difficulty with the bus operation is that too much time is spent at the terminals. These buses are making but 8.64 bus-miles per bus-hour while the average speed actually made between terminals is 11.16 m.p.h. This would indicate that about 30 per cent of

TABLE II—SERVICE AND REVENUE, CANTON CITY BUS LINES OF NORTHERN OHIO POWER & LIGHT COMPANY

Year	Bus-Miles	Bus-Hours	Passengers		Passenger Revenue
			Revenue	Transfer	
1923	129,659	15,136	320,573	90,553	\$18,949
1924	252,137	29,816	697,477	180,161	41,260
1925	293,543	39,298	859,951	197,599	51,298
1926*	456,762	58,669	1,232,758	226,206	73,635

* Last six months estimated.

the drivers' pay is for time when they are not working. It can be remedied by through routing.

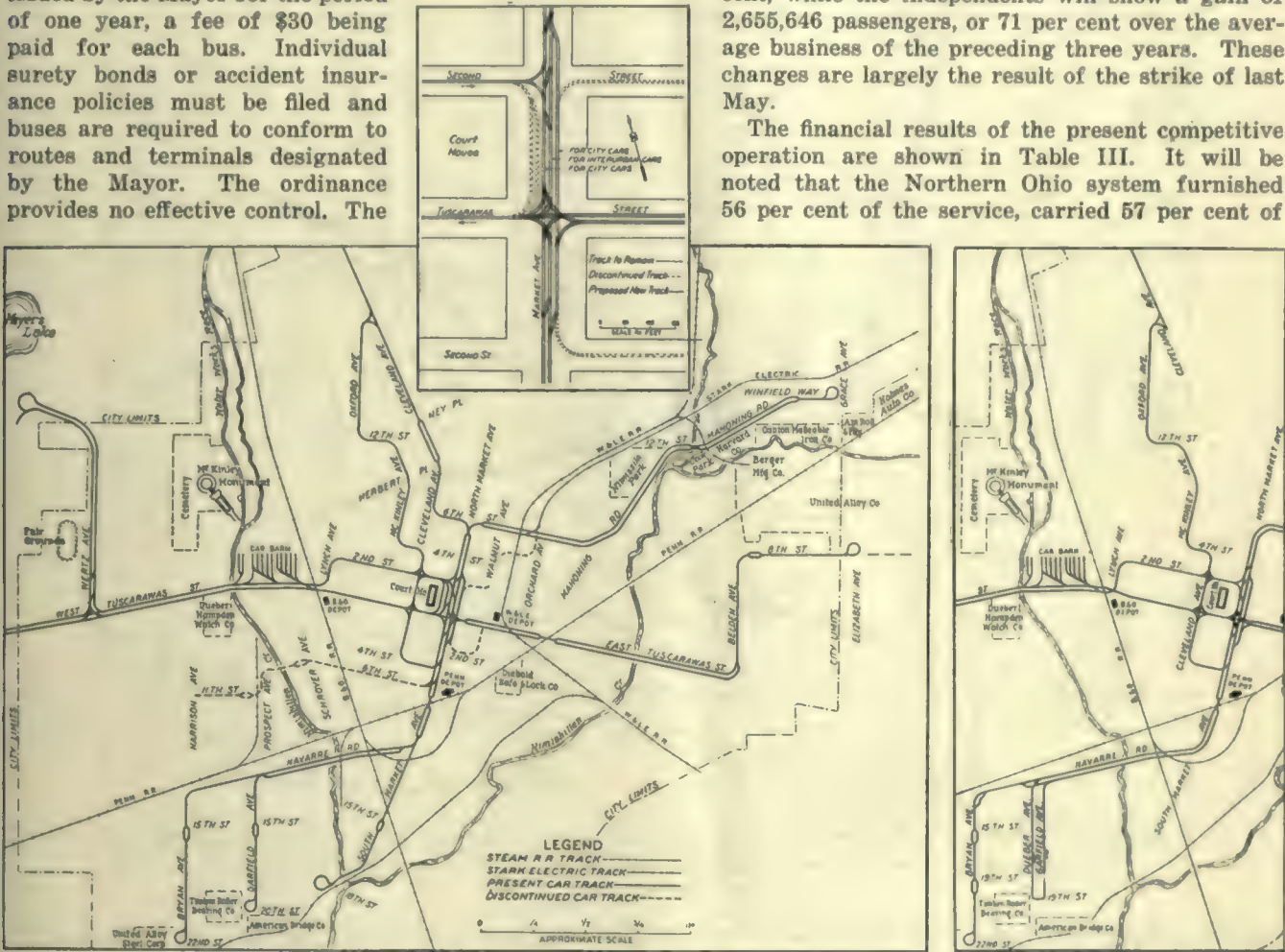
The first bus operation in Canton of any consequence was by independent lines, beginning about 1921 with four buses. The number of independent buses in use has gradually increased until at present there are 36 registered. The average seating capacity of these is 24 passengers. There are eight operating companies or individuals, operating twelve lines. The routes are shown on one of the maps. The older buses are uncomfortable and unattractive and many of the newer ones were second-hand when placed in service. Licenses are issued by the Mayor for the period of one year, a fee of \$30 being paid for each bus. Individual surety bonds or accident insurance policies must be filed and buses are required to conform to routes and terminals designated by the Mayor. The ordinance provides no effective control. The

of whom 6,372,312 or 82.5 per cent are revenue passengers. The passenger revenue, including the 1-cent transfer charge, is \$332,133, or 5.21 cents per revenue passenger. This is a revenue of 20.7 cents per bus-mile.

TOTAL TRAFFIC DECREASING IN CANTON

Traffic carried by the combined transportation systems reached a peak with the year 1923, when 15,983,428 revenue passengers were carried. Since then there has been a recession each year. It is estimated that for 1926 the Northern Ohio city lines will show a decrease of 3,501,368 passengers from last year, or 29 per cent, while the independents will show a gain of 2,655,646 passengers, or 71 per cent over the average business of the preceding three years. These changes are largely the result of the strike of last May.

The financial results of the present competitive operation are shown in Table III. It will be noted that the Northern Ohio system furnished 56 per cent of the service, carried 57 per cent of



At Left, Present Track Layout of N. O. P. & L. Lines in Canton. At Right, Proposed Track Layout in Part of City, Showing All Recommended Changes. The Small Inset at Top Indicates Proposed Track Changes in City Hall Square

rate of fare charged is 5 cents, with transfers issued to other independent bus lines for 1 cent. The map shows that in many cases these lines operate directly over or encroach upon the car lines. There are some places, however, where the independent buses are supplying sections without needed service.

Six routes are operating on a ten-minute headway, three on fifteen minutes, two on twenty minutes and one about every 35 minutes. During the normal hours 27 buses are in operation. Additional service is given on a few lines in the rush, bringing the maximum number operated daily up to 32 buses. The schedule gives about 4,542 bus-miles and 494 bus-hours. The speed is 9.19 bus-miles per bus-hour, with an actual speed of 11.06 m.p.h.

There are some 7,724,018 passengers carried annually,

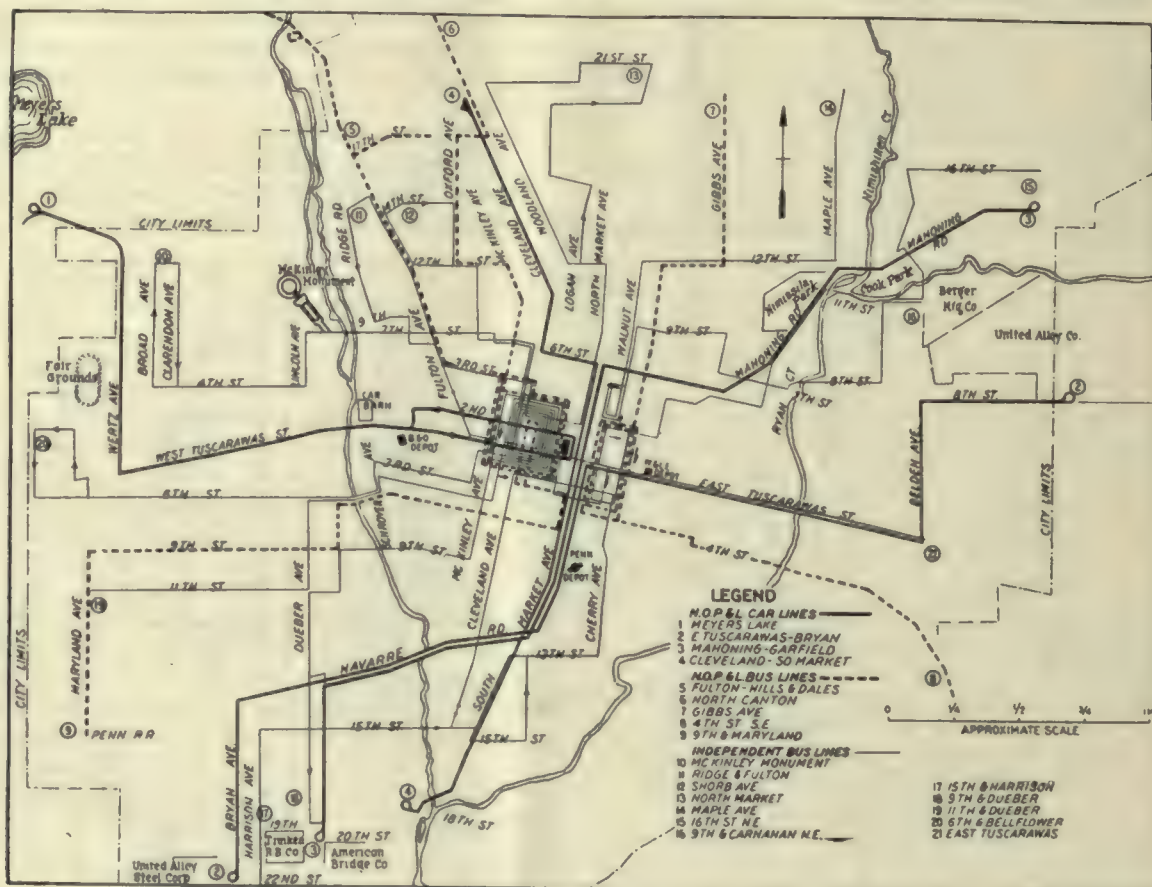
the passengers, and collected 60 per cent of the revenue. Independent buses in the same period provided 44 per cent of the service, carried 43 per cent of the passengers, collected 40 per cent of the revenue.

In the transportation business competition usually brings duplication. Breaking down of service usually

TABLE III—FINANCIAL RESULTS OF ALL TRANSPORTATION SYSTEMS IN THE CITY OF CANTON, OHIO, 1926			
	Northern Ohio Cars and Buses	Independent Bus Operation	Total
Miles operated.....	2,068,658	1,603,326	3,671,984
Hours in service.....	269,730	174,246	443,976
Revenue passengers.....	8,406,697	6,372,312	14,778,009
Operating revenue.....	\$505,754	\$332,133	\$837,887
Operating expenses, including taxes...	\$659,781	\$272,565	\$932,346
Net available for renewals, retirements and return.....	D\$154,027	\$59,568	D\$94,459
D Deficit			

follows duplication, and the effort to meet competition finally forces abandonment of service. Business succeeds only when it pays. The city system in question is no exception to the rule. During the last few years the financial return from operating Canton's local city service has rapidly declined. There is constantly increasing loss through deterioration of the physical property. A portion of the track is not in a good state of repair, and reconstruction under the best standards is an imperative economic necessity. Much of the expenditure now being made for track maintenance is a total loss. Only replacement or retirement will end this

when the city system increased its rates of fare, and these bus operations were confined to profitable territory. Whenever service has been provided to a community for years and competition is established without a corresponding increase in the volume of traffic serious consequences follow. For a time at least the public may enjoy more service than the traffic demands, even at rates below cost. Such a condition is temporary and not for the best interest of the community. More efficient use of the original facilities would have been to its best advantage. A municipality's responsibility to protect the transportation agency contracted with to



Canton Is Given Local Service at Present by Four Street Car Lines, Four Railway Bus Lines and Twelve Independent Bus Lines

expense. The effort to cope with the financial reverses has resulted in abandonment of both service and tracks. The wisdom of this decision can be determined only by the future.

The city's transportation system is virtually part of the city government. One difference is that the transportation system is financed through private capital, while city departments are financed principally through taxation or the sale of bonds. Another difference is that the transportation agency operates under municipal control without municipal responsibility to provide for the cost of operation. On the other hand municipal authorities are charged with the responsibility of providing service by city departments and they are also obligated to collect the full cost of service by taxation or otherwise. This is the true service-at-cost principle.

When independent bus operation was established in Canton six years ago it was not for the sole purpose of furnishing the community with additional transportation facilities but to compete with the old-established rail lines. The new service was inaugurated at a time

furnish transportation service must go hand in hand with its right to control the service.

Under the present franchises the municipality has control over the construction, maintenance and operation of the street car system and also the fixing of rates. During the year 1920 its approval was given to an increase of fare. Shortly afterward the municipality issued permits and sanctioned bus operation in competition with the transportation system. If there had been a genuine demand for additional service at that time the municipality was in a position to secure it from the street car system, for it had contracted with its transportation agency to furnish service under terms dictated by itself. Competitive bus service did not bring constructive development. On the contrary it is now apparent that such operation has been destructive, as the city system is on the verge of collapse.

With the present dual operation, service is given where the traffic is heavy without thought of demand or best interests of the city at large. The city's traffic growth has been absorbed by the competitive bus

service. Independent bus service did not extend except in proved profitable territory. About 80 per cent of the total population is within 300 yards of the Northern Ohio's lines. Further abandonment of the system's facilities will deprive outlying sections of service they now enjoy. Forcing the system out of the transportation field will place complete control of service with the independent operators. The inability of the city to regulate service without responsible management is obvious, and it is quite evident from past experience that a continuation of the present dual plan will not improve the situation.

Collapse of the railway's system is not due to specu-

established service heretofore given by the Northern Ohio system. City-wide bus operation would require the furnishing of adequate service to the city at large, service that would care for the sparsely settled districts as well as the built-up territory. It would also have to care for the heavy rush-hour traffic now cared for by the street railway. Under such conditions the financial result would be entirely different from the present free-lance method of operation, because the lean would have to be taken along with the fat. In other words, they could not continue to skim the cream off the transportation business and leave the skim milk for the street railway that is gradually being starved out.



It Is Proposed to Give Improved Service in Canton with Three Street Car Lines and Seven Bus Lines All Under One Management

lative elements but is the outcome of the present dual operation. During the period 1923-1926 revenue has been insufficient to pay operating expenses, and has not permitted the accumulation of reserves to be used for rehabilitation now necessary. Since the income was insufficient to pay operating expenses it has been necessary to pass up the payment of any return on capital invested in property used and useful in furnishing the service. If the property is to continue to furnish service now, conditions must be created that will make it self-sustaining in order to attract new money necessary for rehabilitation and improvements. If this is not done increasing rates of fare or savings brought about through curtailments of service will but temporarily postpone the final complete collapse of the city system.

BUILDING A CITY-WIDE BUS SYSTEM

Results with the independent buses, which gave net earnings of \$59,568 available for payments on equipment and interest, are from operation in well-populated territory that has been built up largely through long

Bus lines are capable of furnishing satisfactory service to some parts of Canton, particularly where the demand for transportation is nominal. The principal value of the bus is the ability to provide facilities to new sections of the city not fully developed and to sparsely settled districts where service requirements are moderate and no great capacity per vehicle is needed, particularly where routing may be changed or extensions desired.

In the industrial sections and active amusement centers, where demands are made to move large volumes of traffic in a short period of time, the ability of the rail service to absorb heavy loads without confusion or street congestion does provide more economical service than the bus. Transportation schedules are arranged to meet normal traffic conditions. Traffic exceeding normal business will naturally result in delays and congestion unless the flexibility of the service or capacity of the equipment provides accommodations for normal and reasonable surprise traffic.

A first-class bus system would require the investment

of not less than \$925,000. The service would require 45 buses during the normal hours of the day and 65 during the rush hour. Allowing for spares, 75 buses in all would be required. Operating expenses based on 3,766,070 miles per annum would amount to \$723,085, or 4.9 cents per revenue passenger. The cost of taxes, renewals and retirements and a 7 per cent return on the investment brings the cost of service to \$999,210, or 6.77 cents per revenue passenger for the 14,778,009 passengers estimated to be carried.

CO-ORDINATED SERVICE BEST FOR CANTON

A co-ordinated system would require nineteen street cars and 32 buses in daily operation, making 1,162,160 car-miles and 1,907,855 bus-miles annually. The annual operating expenses before taxes, renewals and a return on the investment would be \$606,580, or \$116,505 less than for city-wide bus service. Based on the same traffic this is 4.1 cents per revenue passenger.

Comparing results for the period of a 25-year franchise, with a co-ordinated system the portion of the investment in tracks, land and buildings can be expected to give service during the entire time. The investment in street cars at the most would have to be earned and returned twice, while the investment in buses must be earned and returned six times. Under a city-wide bus system a small portion of the investment, that in land and buildings, could be expected to last the entire period, but the major part, or 80 per cent of the investment, must be earned and returned six times. During the 25 years it is estimated that the difference between the two methods will equal a saving of \$1,500,000 to \$2,000,000 to the riders under the co-ordinated system.

With these facts in mind it can be seen that a co-ordinated system under one management with street cars and buses, each type of service being employed where it is best adapted to the local requirements, will give, under proper regulation, the most satisfactory and efficient service.

The routing for such a co-ordinated system recommended for Canton is shown on one of the maps. Comparison of this with the map of present routes illustrates the contrast between competition and duplication on the one hand and the service best adapted to the requirements of each section of the city on the other hand.

THREE RAIL AND SEVEN BUS ROUTES WOULD SERVE THE CITY

Under the proposed plan three railway routes and seven bus routes would be operated. It would be possible to raise the schedule speed of the cars from 7.75 m.p.h. to 9.92 m.p.h. with a certain amount of double tracking and by putting all track in good operating condition. Improvements planned in the track layout in the Public Square are shown in the inset map. The present carhouse is in an advantageous position near the center of the city. It is so arranged that serious delays are occasioned in switching cars in and out. This condition should be remedied and the appearance of the carhouse improved. Present overcrowding of the carhouse would be avoided, as the number of passenger cars needed would be reduced from the present 74 to 26. Under the proposed plan 36 buses would be needed, and suitable garage facilities can be provided by remodeling the unused power station adjoining the carhouse.

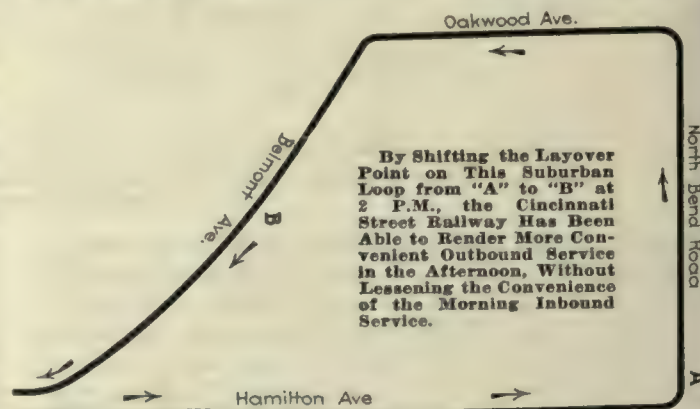
Improving Service on Long Suburban Loops

BY CHANGING the layover points on two suburban lines having long loops at their outer ends the Cincinnati Street Railway effected a substantial improvement in service. The Westwood and College Hill lines, after a run of about 8 miles from the downtown section, terminate in long loops through their respective residential sections. Each loop is nearly 2 miles in circumference. The two suburbs served by these lines are on isolated hilltops and no other parallel lines are available to the residents.

From time immemorial the layover point on each of these loops was, at all times of the day, at the outermost point of the loop, as indicated on the accompanying sketch by the letter A. With this condition, persons living along the outbound half of the loop, AX, had good service to their homes on outbound trips. However, when they desired to go to town in a hurry they had to walk to the junction point, X, or ride completely around the loop with transfer at A. One waiting car did not leave the layover point, A, until the car behind arrived and it could be learned whether any city-bound passengers, picked up along Hamilton Avenue, wished to transfer.

Just the reverse was true for persons living in the side streets on the other side of the suburb. On the inbound trip these residents had direct service along Belmont and Oakwood avenues. But, returning from town, they had to take the circuitous ride around the loop, with transfer at the end of the line, A. Otherwise, a walk across the suburb from the outbound track was necessary.

With a view to relieving this situation a new method of operation was adopted. Until 2 p.m. the layover point remains at A; after 2 p.m. cars and crews rest at B, well in on Belmont Avenue. This shifting resulted



from a traffic count, which showed that until 2 p.m. more persons were riding into town from College Hill or Westwood, while after that hour the greater number of passengers were outbound. Waiting at A, the car covers most of the suburb and proceeds directly to town. After 2 p.m., by proceeding around the loop to B before laying over, cars carry most passengers as directly as possible to their homes. Very little transferring to the car ahead is necessary on this system. The same principles are used to guide layovers on the Westwood loop.

Residents of the two suburbs, when interrogated by Hudson Biery, director of public relations Cincinnati Street Railway, expressed approval of the new system.

"Collective Management" Works Well at Pittsburgh

Representatives of Trainmen Make Suggestions at Joint Monthly Meetings with Operating Officials—Disposition Is Reported at Next Meeting — A Summary Is Given of October Proceedings

JOINT meetings of operating officials of the Pittsburgh Railways and representatives of the trainmen's organization have been held monthly beginning in February, 1926. These meetings were inaugurated as a way of showing the trainmen that their co-operation is desired, not merely as obeyers of orders but also as originators of improvements in operation, whether for the good of the employees themselves, the patrons or the company.

At these meetings the accredited officials and other representatives of the union make suggestions. Each is given an "item number" and assigned by the management to the appropriate operating official or committee for consideration and reply at following meetings. How the plan works can best be understood from the following digest of the proceedings on Oct. 26.

The first order of business was the statement by Vice-President Thomas Fitzgerald giving comparisons of 1926 operations to date with the same period of 1925. These statistics, presented in standard form at every meeting, cover revenue for the year to date and for the preceding month, motormen's and conductors' wages, passenger car-miles operated, total passengers carried and status of the balance sheet for the year to date after operating expenses, taxes, payments to the communities, etc. Any one of the 150 or more attendants is welcome to ask questions on points not elucidated in the presentation of the figures.

SUGGESTIONS CONCERNING EMPLOYEE WELFARE

Disposition of some of the suggestions brought up by the trainmen's representatives at earlier meetings was reported by W. T. Rossell, general manager. For example:

Shower baths for a certain carhouse. Suggested June and August; baths completed Sept. 17.

New schedule for Route 75. Suggested July 28. Ready for picking by end of October.

Paper drinking cups for several locations. Suggested July. In use.

Toilet facilities at end of a given line. Suggested July. In use.

Layovers on certain lines. Suggested August. To be considered in making up new schedules.

Tripping hazard caused at a carhouse yard from water-pipe connections for car-washing stand extending to the ground. Suggested August. Reported that these pipes had been lowered and inclosed in a receptacle.

New sand cars for Herron Hill. Suggested August. Now under construction.

Electric lights for crews' room. Suggested August. Completed.

Automobiles fail to stop at crew-change point in front of carhouse. Suggested August. Steps taken to remedy this.

Certain type cars reported to leak at roof in rain. Suggested August. Several of this type already attended to.

Seats for conductors on certain type car. Suggested July. Sample seat installed on one car and approved as satisfactory by transportation department.

Register rods too high on certain type car. Suggested July. Shops prepared to lower rods after further conference between interested parties.

Changing curtains on left-hand side of motorman on certain type cars. Suggested July. This called for changes in longitudinal seats and seat panel. Remodeled car submitted to original reporter, who declared it satisfactory.

Heat for motorman in certain type car. Suggested July. Reported that fabrication of all material necessary for relocation of the operator's heater had been issued and that job would be done in about one month.

Water in certain drinking fountain not cold. Reported August. Suitable coil installed.

Raise motorman's part of platform $1\frac{1}{2}$ in. to keep his feet dry in certain types of cars. Suggested August. Cork mat approved by original suggester with the amendment that the corners be rounded on the side nearest the entrance to prevent passengers from tripping.

Schedule on one suburban route too fast while track remained in present shape, as this led to abuse of the car. Details of worst locations were given. Reported August. Further inspection and necessary repairs were promised.

Hot-water line extension desired from shower baths to wash basin in dispatcher's office at certain carhouse. Done.

Draft reported back of the conductor's position on certain type cars. New weather stripping has been installed.

Suitable covering desired for steel benches in crews' quarters at certain carhouse. Done.

Shower baths at one carhouse reported out of order. Repaired.

Larger quarters requested for a blind ex-motorman who runs a store in one of the carhouses. Suggested June. These quarters were enlarged as desired.

SUGGESTIONS FOR BETTER TRACK, SIGNAL AND OTHER TRAFFIC CONDITIONS ALONG THE ROAD

Drainage of electric switches and splashing. Several trouble spots were reported. A statement was presented showing how each case had been remedied or would be in the near future. In one instance, a drain pipe was being built to a new sewer, and, in another, negotiations were up with the borough to permit street opening for the purpose. In a third case, the needed sewer was "discovered" after a first failure.

Sign for dangerous car turn desired at certain intersection. Suggested July. Reported installed.

Street light wanted at certain corner. Suggested August. Reported as cared for.

Varous suggestions made concerning right-of-way for cars over automobiles on certain narrow highways, parking rules, etc. These suggestions were taken up with the traffic department of the city of Pittsburgh and relief obtained in several instances.

Street lights turned out too early. Suggested August. This led to a conference with lighting company officials, who explained how the turn-off times throughout the year were ascertained and the schedule approved by the municipalities concerned. No change was contemplated at present.

Cut door in a suburban post office building to avoid blocking of track by mail trucks. August suggestion. Inquiry developed the fact that the post office property was leased, so that the change was not financially practicable; also, that the delays were not serious.

Two suggestions were to the effect that the interval allotted by automatic traffic signals at certain intersections be increased. Both suggestions were carried out.

Complaint made that certain concerns operating trucks

in the dark hours of early morning do not carry tail-lights. Arrangement was made by the management to get into personal touch with the executives of offending companies. Car operators are provided with a report form to make such inquiries possible.

Light suggested for certain derail switch. Done.

Automatic non-clearance curve signals suggested at given location. Funds therefor have been set aside.

More powerful headlights, similar to those on a neighboring route, were suggested for a suburban line. Suggestion accepted and work under way.

Street light suggested at certain place in an outlying borough. This had been taken up with the borough authorities.

COMMENTS MADE ON CAR EQUIPMENT

Rough riding on one of the older series of cars was mentioned in July. Reported that all trucks were being overhauled.

Special adapter for the standard mirror was adopted to make it satisfactory for a certain type of car, following a suggestion made in July.

Suggested painting of stanchions on low-floor cars owing to the flaking off of covering, which left them unsightly. Suggested August. Reported that 200 cars had already been handled.

Window wipers needed new rubber. In hand.

Unsanitary condition caused on certain cars through arrangement of piping that tempts some of the early morning riders to treat it as cuspidor. Suggested July. Plan for covering not yet fully developed, but meantime a "No Spitting" sign of special character will be placed near this piping, bearing the signature of the Director of Public Health.

Air brake and sanding problems as seen by the motor-men have led to careful study of conditions on certain types of cars. Scant flow of sand in one case was followed by enlargement of sander ports. On some cars the rear sand levers did not operate freely and called for correction. In certain train operation emergency application with automatic release of sand had a tendency to reduce the air pressure too much. A joint committee is now going into the whole question of sanding and braking improvements.

SUGGESTIONS INTENDED TO HELP SELL RIDES

The suggestions with regard to transfers indicate a deep-seated belief that some persons still manage to get a two-way ride for a one-way fare. On the other hand, some suggestions call for additional transfer privileges. One suggester thought that the liberal provisions of the 10-cent crosstown transfer should be advertised more often so that fewer persons would pay double fare unwittingly. Several others recommended a more frequent cleansing of fare box glass so as to insure that the company got the fare really due.

Other suggestions showing the interest of the trainmen in promoting business were as follows:

Shorten headway on certain route. Now being checked over.

Relocate car stops for greater convenience of passengers, at specific locations.

Install shelter at certain point. Suggested August. Done.

Provide loading platform. Raised platform was impracticable, but a safety zone was provided.

SAFETY CO-OPERATION WITH TRAINMEN

One outgrowth of the interest shown by the men in safety and traffic problems was the selection of a committee to attend the Detroit meeting of the National Safety Council in October, 1926, at the company's expense. The men were told they could select one delegate from each carhouse in any way they saw fit. It was decided to leave the matter to chance by the time-honored method of drawing numbers from a hat. The

first number took care of the first choice and the next two were for alternates.

The Amalgamated Association will also, following the suggestion of one operator, appoint a committee of experienced trainmen to call on the City's Better Traffic Committee to set forth the experienced motorman's viewpoint of city traffic conditions and the remedying of their evils.

PRaise FROM UNION EXECUTIVES

The October meeting was marked by the attendance of P. J. Shea, member of the general executive board of the union. Mr. Shea spoke highly of the Pittsburgh plant and said it was in line with the co-operative management plan recommended by President Green of the American Federation of Labor. He was pleased with the way the various suggestions had been taken up by the management. He commented on the difference in conditions from the days of non-vestibule cars to the point where operators could ask for and get more electric heat.

He advised the trainmen to be responsible and not "overload this opportunity." The Amalgamated, he continued, would do all in its power to help along such work as was being done in Pittsburgh. The trainmen were the salesmen of the Pittsburgh Railways. Contented salesmen were always better salesmen than those who have a fight or grouch against the company.

He could see that great results had already been obtained, and with 100 per cent booster co-operation they would be still greater. The men now realize that the officials of the company are putting all the cards on the table, telling the truth from day to day. The old feeling that this or that statement was a lie had gone.

Following Mr. Shea came P. J. McGrath, financial secretary of the union and seventh vice-president of the International. He said that in the old days any union officer caught in company with a railway official was sure to be fired by his members. It was different with meetings conducted in this spirit. In one month more good was done in mutual relations than the old-type business agent could have done in a year, even if he had had no other duties than following up grievances.

Tulsa in 1907

OKLAHOMA street car systems, it is said, never passed through the "horse car" age owing to the fact that they were established after the advent of the electric railway. The fact that horse cars were run in Tulsa for one week as a temporary measure was revealed, however, by a recent historical sketch in the *Tulsa Tribune*. The first street car line was established in Tulsa in 1907, by C. H. Bosler of Dayton, Ohio. On this establishment the *Tribune* states:

The first line was laid on Main Street and at practically the same time a line was run out Second Street to Cincinnati Avenue, then north, past where the Hotel Tulsa now stands. This line was hurried to completion in order to reach an east side addition by a certain date. But while the line was completed on time, the company found itself without electric power. It did not build its own power plant, but had contracted for current from the Tulsa Corporation, which failed to deliver it at the time set. The company was in a quandary as to what to do. Clarence Kline, now the receiver for the Tulsa Street Railway, who superintended the building of the line, found a way out. He harnessed horses to the cars and had them running to the addition in time to fulfill his contract. Horses were used for more than a week.



A Group of Homes Erected on the Property Formerly Owned by the Railway

A Railway Enters the Homesteading Field

Concord Electric Railways Employs Several Interesting Expedients in Tackling the Problems of Small Revenue, Ruinous Automobile Competition, Run-Down Equipment and Public Indifference—Conditions Are Now Improving

MAKING a little go a long way" is a phrase which needs no explanation to the average railway operator. Methods by which this has been done on a typical smaller community property should be of interest to other railways with similar characteristics and problems.

The Concord Electric Railways, which serves the territory in and immediately surrounding Concord, N. H., has had its full share of difficulties since the able-bodied specter of the private automobile came to haunt the waking and sleeping moments of railway men generally. Owned by the Boston & Maine Railroad, it has been expected by that organization to stand upon its own feet financially and to pay as it goes. Concord is a community of approximately 22,000 inhabitants and, with the small outlying settlements, the railway has a total possible clientele of around 25,000. The largest industry in the community is the Rumford Press, which prints many magazines with national circulation and employs well over a thousand individuals. In addition there are a number of small mills and sundry other industries in the town. As a community, however, the town is comparatively wealthy and an exceptionally large proportion of its citizens own one or more automobiles. Naturally there are many "stormy-weather riders," but in the pleasant summer and fall months the railway is hard put to it to hold its own.

Eight years ago John B. Crawford took over the reins of authority on the local property and assumed therewith the difficult task of convincing the local townspeople that a community without adequate public transportation would be in a very bad situation indeed. At about the time Mr. Crawford came to Concord things

were in rather a bad way. Of maintenance equipment the railway was woefully lacking. Its track was run down and the rolling stock left much to be desired.

When the new management took control and began to clean house shop equipment was badly needed, and since no funds were apparently available for its purchase, ways were sought to secure the necessary funds. A happy inspiration suggested the sale of old copper, steel, and assorted junk which had been lying about the shop and storerooms beyond the memory of the oldest inhabitant. The assortment was extensive, and enough money was derived from its sale to provide a lathe, a drill and several other indispensable pieces of equipment.

FUNDS FOR IMPROVEMENTS SECURED BY SALE OF SURPLUS EQUIPMENT

What to do with the older cars which were standing about on storage tracks in various stages of disrepair was the next problem. It was decided that since the junk value of the cars would not average more than \$250 and since the value of the actual parts and equipment on each car would run at around \$1,029, the wisest plan would be to strip the cars and store the parts for use in replacements. Accordingly everything of any possible use was stripped from the ancient rolling stock, even the window glass and sash being salvaged for future use. Several cars were equipped with HL control, and as this type of control has been abandoned by the local road it was planned to sell the equipment when a purchaser could be found.

Next the relative needs of track and rolling stock were weighed and it was decided that the track was so far gone that immediate and drastic steps would have

to be taken to repair some of the worst stretches. Money was not available for giving necessary attention to both of these items and since even new cars operating over impossible track would be of little avail the latter was given priority. The existing rolling stock of the company was not neglected by any means, however, but rather was carefully gone over, rebuilt and painted throughout. Just in the past two years the company has adopted the vivid yellow-orange color which is standard on the Boston Elevated, and has found that the results are all that might be desired both in attracting favorable notice on the part of local citizens and in reducing the accident hazard. The company feels that frequent and careful painting is the cheapest form of

provided with garages. All of these homes have been built within the past two years and more are constantly going up. Thus the railway was able to dispose of this and several smaller pieces of real estate at fair prices and at the same time to encourage patronage of the street cars.

MAY BUILD A RESORT HOTEL FOR WORKING MEN AND WOMEN

Another large piece of land is owned by the Concord Company on Contoocook River. It is 80 acres in extent, being roughly divided into equal parts which are located on opposite sides of the river. On one side of the river is Contoocook Park, an amusement park owned and



At the Extreme Right, the Site of a 100-Room Resort Hotel Which May Be Operated by the Railway

sales effort which it is possible to make and has spared no effort in keeping its equipment in first class condition.

DISPOSING OF FROZEN ASSETS

Having given careful attention to the actual physical equipment of the property as outlined above, Mr. Crawford next began to examine into other and perhaps unsuspected channels of possible revenue. He learned that several parcels of real estate on the outskirts of Concord had been held by the company for years as investments. No income was being derived from these pieces of land and they were a constant drain because of taxes, loss of interest, etc.

At last the expedient of selling the land for subdividing was hit upon. One large section of 40 acres adjoined the trolley line which connects Concord and Contoocook Park and this was sold to the Eastman Home & Development Company. This company will build foundations and the outside structures of houses, leaving the interior work to be finished by the purchasers as time and pocketbook will permit. Thus the development is more attractive to workingmen and people with small incomes, the very type which the railway is particularly glad to welcome into the community. They are unlikely, or perhaps it would be more accurate to say less likely, to own automobiles, and very few of the 28 homes which have thus far been erected on Concord Manor, as the property has been christened, are

operated by the railway company, and on the opposite side is a wide expanse of forest land. Here the company talks of erecting a 100-room resort hotel catering exclusively to working young men and women in moderate circumstances. The charges would be made as reasonable as possible, and as the park and its environs are delightfully beautiful and unprofaned by commercialization it should be a real treat for city workers to spend their vacations there. Incidentally the automobile roads to the park are poor and the trolley is the logical method to be employed in reaching the spot.

The park itself has many attractions calculated to attract patronage from Concord and nearby communities. Roller skating, free outdoor moving pictures, band concerts on Sundays, dancing, shooting, swimming, canoeing and various other pleasures are at the command of all who attend. Fireworks feature special events and open cars are operated to the parks whenever one of these special celebrations occurs. Patrons who ride to the park on street cars are given admission as a part of their regular fare, while others must pay an admission fee of 10 cents. The park is open from Decoration Day to Labor Day and is a fairly profitable source of revenue to the company. It at least encourages riding on the cars and, further, prevents Contoocook River, which is a natural beauty spot, from being harmed by careless and indiscriminate exploitation.

All of the cars on the Concord property are now one-man operated. This was not accomplished without con-

siderable educational work among the local citizens and newspapers. Some opposition was also encountered at first from the unions. However, the whole situation was at last ironed out and now the cars are running with very little hostility to the manner of operation expressed or implied by patrons or men.

Due to the fact that the company has its own hydro-electric plant, its cost for electric energy is quite low. This makes it possible for the railway to operate its cars at an average cost of 21 cents per car-mile, this in spite of the fact that many of the cars are rather old and decidedly heavy. Careful maintenance and a gratifying feeling of responsibility on the part of operators may also be thanked for a large share of the saving.

BUSINESS HAS IMPROVED THIS YEAR

In spite of the ruinous competition with the privately owned automobile, which continues to be used to and from work regardless of the fact that it generally costs its owner around a dollar per day for that privilege, the business of the Concord Electric Railways has shown an improvement during the first half of the present year. This fact is partially explained by the vigorous efforts which are being made to get the trackwork of the company into satisfactory shape throughout the entire system, to improve the rolling stock as much as possible and to keep it thoroughly clean and attractive at all times, and generally to improve public relations with the citizenry of Concord.

Mr. Crawford has done considerable writing for the local newspapers and has also run series of "Traction Tom" and other advertisements. He believes that the only wise policy is to lay all of the cards on the table and to tell the people just what you are going to do and why. The management is always ready to go much more than half way in adjusting grievances, real or fancied. As an example of this the pains which the company took in striving to cut down radio interference by various elements of its system might be cited. Considerable money was expended in examining and repairing all faulty bonds, in supplying converters with soft graphite brushes and in similar precautions. Such efforts as these may be classed as being secondary in importance, for the active salesmanship and aggressive operating practices are even more important in guaranteeing the future of the company.

BUSES DO NOT SOLVE THE PROBLEM

It has been suggested to the local management that the installation of buses might mark the turning point away from the company's difficulties. Careful examination of local conditions disclosed, however, that buses could not be operated over the type of roads in and about Concord for much under 35 cents per bus-mile. This is a very poor comparison with the 21 cents per car-mile which the present street cars have accomplished. Furthermore the company believes that the citizenry of Concord who would ride in buses are equally willing to ride in the street cars, the wealthier classes being largely indifferent to any and all forms of public transportation except at such times as their own automobiles are unable to traverse the highways.

In conclusion it is interesting to point out that some time ago, when the Eastman Home & Development Company, which was the organization to take over the railway's property and subdivide it, attempted to make a similar development of a piece of property in East Concord it was unsuccessful, due to the fact that no

street car line adjoined the property. The type of people looking for inexpensive homes were not interested in lots unless served by public transportation. Hence it would appear that the Concord Electric Railways has a real mission to fulfill in this territory. Its economies and temporary makeshifts have served it well. It is characteristic of the more progressive type of management that the company should be planning today, not for tomorrow or for next year, but for the needs and probable public demands of several years hence.

Trucks Turned to Advantage by Ohio Interurbans

DRIPPING the old attitude that truck lines are competitors and taking them under its wing, or rather hooking them up as a part of its system, the Southern Ohio Public Service Company, operating the electric interurban line between Columbus and Zanesville, Ohio, started a freight service that has given Columbus wholesale and jobbing houses a distinct advantage in the territory beyond Zanesville as far east as Cambridge.

To make this possible it has taken more than a year of effort by the company operating the interurban line to interest truck line operators in filing a schedule of rates with it, the Public Utilities Commission and the Interstate Commerce Commission. This now makes it possible to give a through rate from Columbus to points in the territory affected by combined transportation of electric line and trucks.

Under this arrangement the interurban line has become a feeder for the truck lines and vice versa, and as a result Columbus wholesale merchants have gained a distinct advantage, with a selling point in their favor because of the reduced time in delivery of orders.

Prior to the establishment of this combined service three days was required for delivery of orders by Columbus firms to their customers in Cambridge. Under the present arrangement freight delivered at the freight station of the interurban line, at Third and Rich Streets, before 4 p.m. leaves Columbus at 11.25 p.m., and arrives in Zanesville at 6 p.m. the following day. There it is picked up by trucks and delivered at the place of business of the Cambridge retail merchant by noon or before.

Points other than Cambridge in the eastern section of the state benefiting by this service are Adams Mills, Buffalo, Byesville, Conesville, Coshocton, Crooksville, Dresden, Frayersburg, New Concord, Norwich, Pleasant City, Roscoe, Roseville, Trinway and Tyndale.

A Columbus wholesale firm a few days ago was advised by one of its retail customers in Cambridge that for the first time in 30 years he had been able to order one day and receive the next, an achievement he attributed to the new arrangement.

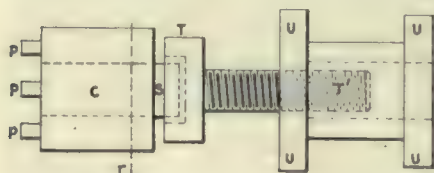
The Columbus wholesale market gains its advantage in the territory affected because other cities are said not to have the means at hand for making deliveries within so short a time as the new service affords to the city of Columbus.

With this service started on the eastern division, operated by the Southern Ohio Public Service Company, similar service is in process for reaching points that can be served on the western division by the Indiana, Columbus & Eastern Traction Company.

Maintenance Notes

Follower Device for Installing Commutator Nuts

SINCE commutator nuts usually extend in underneath the front edge of the commutator, special wrenches are commonly used for tightening. In the department of electrical repairs of the Brooklyn-Manhattan Transit Corporation commutator nuts are screwed up while hydraulic pressure is applied to force



Details of Follower Device Used in Installing and Removing Commutator Nuts

and hold the commutator in position. An accompanying illustration shows one of the company's large railway armatures in a press while the commutator nut is being tightened.

The end of the commutator rests against the crosshead of the press and pressure is applied to the outer end of the shaft so that the commutator is pressed firmly into position. For screwing the commutator nut into position a pinion with dowel pins is used. The wrench is applied to the teeth of the pinion so as to

produce the turning movement. In addition to this, a special follower device is used to support the commutator end of the shaft.

The accompanying diagram shows the details of construction of the follower device and pinion. An old pinion with three projecting pins is shown at *C*. This pinion has the bore enlarged so that it will slip onto the commutator end of the armature shaft easily. The three pins shown at *P* engage corresponding holes in the commutator nut as the armature is supported as shown in the half-tone. The pinion is used to provide a means for reaching into the commutator nut and enough of the pinion extends beyond the crosshead of the press so that a hook-shaped wrench can be used for turning.

The follower consists of a saddle-shaped casting shown in the diagram at *U*, together with a cupped head screw designated as *T*. The part *U* rests in the tail crosshead of the press. With the armature in place, the cupped head *T* is run up until it almost touches the pinion. The nut can then be tightened or loosened as desired.

The depth of the counterbore in the cupped head *T* exceeds slightly the full travel of the commutator nut so that the head can be run back and forth by hand to keep

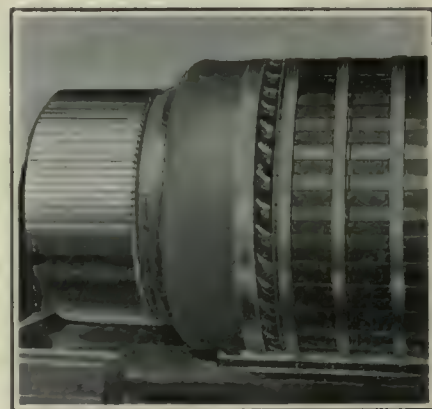
the dowel pins in engagement with the commutator nut.

Use high-grade carbon brushes to "keep that school girl complexion" on the face of your commutators.

New Canvas Hoods Decrease Armature Failures

EXPERIENCING a considerable number of armature failures due to the collection of conducting substances under the canvas hood necessitated the Wilkes-Barre & Hazleton Railway, Hazleton, Pa., changing the hood design.

It had been the practice to install

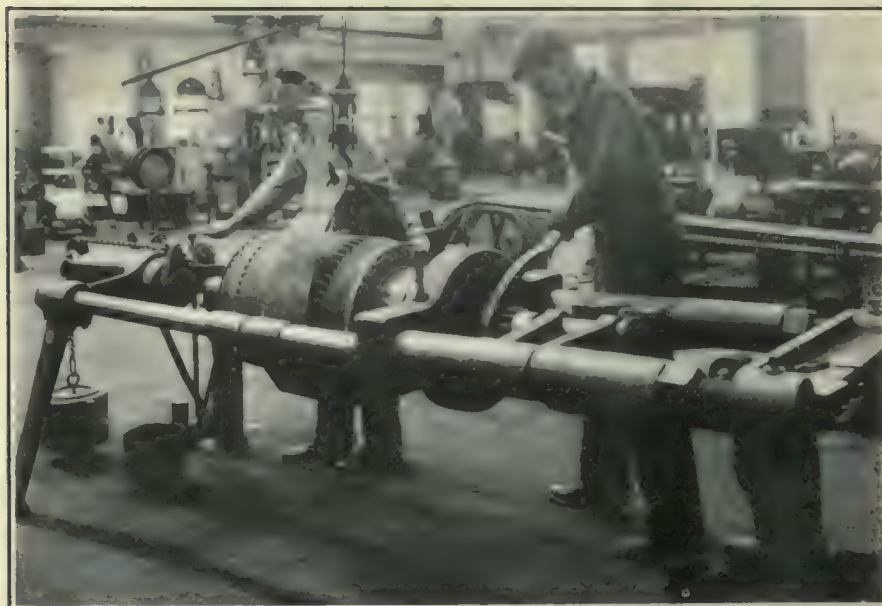


Canvas Hood with Exposed Coils

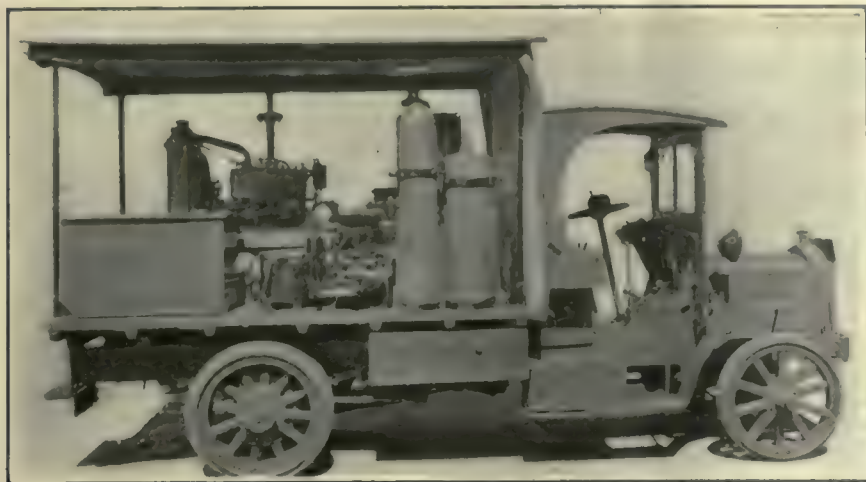
the canvas hood on the commutator end so that it was held under the first banding wire on the armature core. This resulted in an accumulation of brake shoe and carbon dust under and around the coils when they left the core slot, thereby causing grounds and short circuits.

After the old canvas hood is removed the accumulated foreign material is blown out and the coils wiped off and painted with a thick coat of insulating varnish.

The new hood is installed with a separate new banding wire so that about 2 in. of the coil is left exposed where it leaves the slot. This permits of more ventilation and at the same time eliminates the dangerous dust pockets. It is claimed this change has materially decreased the armature failures.



Tightening a Commutator Nut in a Hydraulic Press



On the Right Side of This Truck of the Capital Traction Company Are the Air Compressor and Oxygen and Acetylene Tanks

Compressor and Welder Mounted on Truck

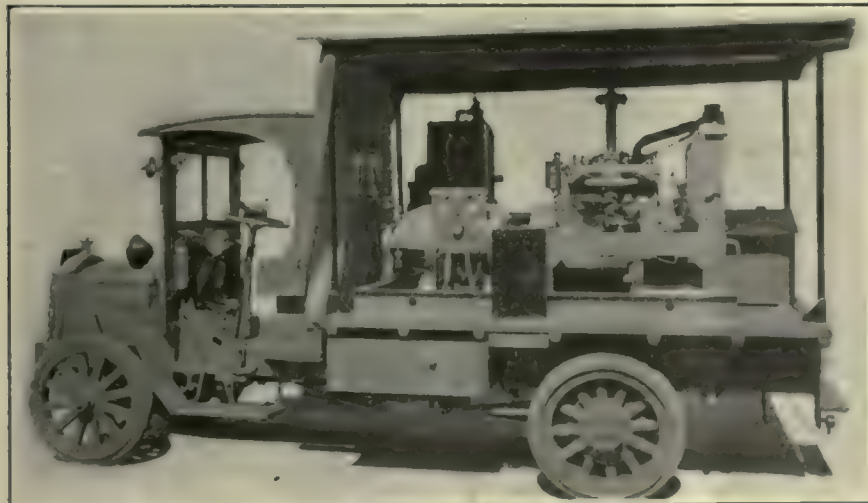
FOR various classes of track repair, a truck has been very completely equipped by the Capital Traction Company, Washington, D. C., with apparatus driven by a gas engine for producing a supply of compressed air and current for welding purposes. Gas tanks are also included.

As the amount of equipment carried is quite heavy, it was necessary to use a truck of 2-ton capacity. The equipment comprising the outfit includes a gasoline engine-driven arc-welding set. The generator is a General Electric Company type WD-

12, rated at 250 amp., 6½ kw., 25 volts. This is coupled through a flexible coupling to a 25-hp., 4-cylinder Buda engine which operates at 1,440 r.p.m. In addition to this equipment a DH-16 Westinghouse air compressor is mounted on the truck. This compressor is operated by a 600-volt motor. Attachment plugs and a switch box mounted on the side of the truck are used for connecting this compressor with the underground conductor rail by means of a plug inserted in the slot.

After welds are made, the rails are smoothed off by means of an air-operated emery wheel grinder. By having this as a part of the truck equipment, a complete job can be finished without the necessity of sending additional equipment to the location. Oxygen and acetylene tanks are carried on the truck for welding or cutting with gas and tool boxes are also provided to carry the necessary tools to make minor repairs.

Bearings, like people, are inclined to get "hot under the collar," especially in warm days. Just try a little more oil.



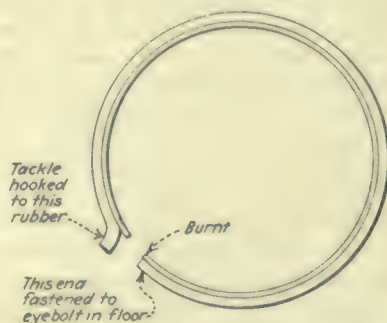
Gasoline Engine and Generator with Switch Box and Plugs for Connecting the Air Compressor to Trolley Voltage. The Air Compressor Is in the Rear Just Back of the Generator

Since with this equipment it is unnecessary to connect the welding outfit to the trolley wire, the welder can do considerably more work than with the ordinary welder, as no time is lost in moving from place to place to get the welder started. Since most of the track operated by this company is of the underground conduit type, it is necessary when using an electric-driven generator for welding purposes to dig up the street in order to make connection to the conductor rail by passing the leads under the wheel rail and into the conduit. With the gasoline-driven engine set, it is unnecessary to do this. The acetylene outfit enables the welder to make such cuts as are required in the rail without having extra apparatus sent to him.

*Poorly maintained cars should pass
Into the "pray as you enter" class.*

Old Truck Tires Used for Track Switch Plugs

WORN-OUT solid rubber truck tires which had been sold to the junk dealer in the past are now being salvaged and made a part of the railway stock in the shop of the Harrisburg Railways, Harrisburg, Pa. The steel rim supporting the



The Steel Rim and Rubber Tire Are Cut Apart to Facilitate Removal

rubber is cut by means of acetylene and the rubber cut through. One end of this split rim is fastened securely to an eyebolt in the floor and a pulling tackle is fastened to the rubber on the other end. By means of the tackle the rubber is stripped free of the rim. After removal the rubber is cut into pieces 2 in. x 2 in. x 1 in. and used for track switch plugs to keep the switch tongue in a set position. It is found that this rubber is very effective for this work due to its live condition.

New Equipment Available

Single Grade of Insulating Oil for Various Uses

OIL of special grade employed for insulating and cooling oil-insulated apparatus such as transformers, circuit breakers, feeder regulators and other oil-insulated and oil-cooled apparatus is being placed on the market by the Westinghouse Electric & Manufacturing Company under the trade name of "Wemco-C." By using a single grade of oil, stocks are much simplified, and after a long period of research development in connection with the oil refiner the Universal oil has been adopted.

Tests made in accordance with Specification D-117 of the American Society for Testing Materials place the dielectric strength of "Wemco-C" oil at 22,000 volts. This result is an average of five trials on the same sample of oil placed between horizontal electrodes 1 in. in diameter with their flat surfaces 0.1 in. apart.

The oil has a viscosity of approximately 57 seconds at 40 deg. C. and 280 seconds at 30 deg. C. The lowest temperature at which the oil will flow, which is called the pour test of the oil, is — 40 deg. C.

The dielectric strength of oil is affected by even a minute trace of water. "Wemco-C" oil is produced under conditions which insure its cleanliness and dryness in the sealed container. In circuit breakers, and to a less extent in transformers, the oil may receive some water in service, and it is important that the oil have the property of quickly separating from the water. This property is known as demulsibility and is determined by the resistance to emulsion test, in which the sample of oil

is subjected to steam and the time required for separation of the oil from the water is noted. "Wemco-C" oil has a resistance to emulsion number of 25 seconds.

Ventilator for Bus Cowl

BY MAKING use of the air currents that rebound from the windshield of a motor bus and are forced down and around it and the top of the cowl, together with the installation of a ventilator, the Nichols-Lintern Company, Cleveland, Ohio, has overcome some unusual limitations. The Venti-Duct, as this new product is called, ventilates the cowl by means of an air duct. It delivers a strong current of air into the body during rainstorms and in hot weather.

Air is admitted through holes punched in the outside panel. These are trimmed with a suitable fixture. The outer and inner panels are used as walls for the duct. A hole through the inner panel at a suitable point for admission to the cowl and a suitable regulative means, such as the ordinary ventilator grille, together with small drainage holes in the outside panel, complete the device.

The air passes down through the air duct to an opening in the body interior. Located some distance below this opening are several small drain holes. The air rushes to the bottom of the duct and then rises through the opening into the interior of the body. Due to the tendency of the air to rush to the bottom of the duct all rain, snow and other foreign matter are dropped at the bottom before the air enters the body interior. As a result, the Venti-

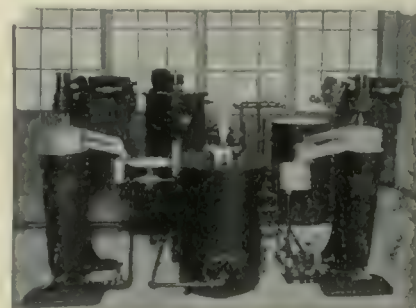
Duct is weatherproof. On the inside of the duct the entrance into the body interior is protected against the direct driving in of rain or snow by a hood or baffle.

As the Venti-Duct can be contained entirely between the outside panel of the body and the interior false panel, its use does not affect the appearance of the body. It can be installed in some form in any type of body. The location of the outer opening is, however, important.

*Operator's version of the "I.W.W."
"I"mproved "W"orkmanship
"W"anted.*

Circuit-Breaker Oil Reclaimed Cheaply

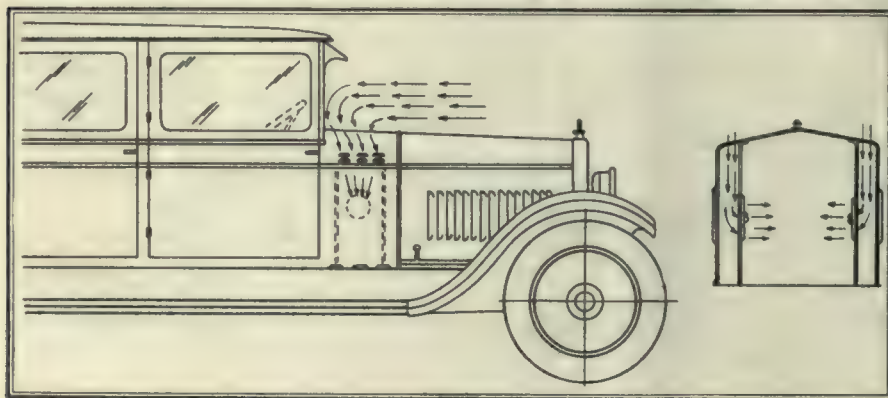
CONTAMINATED circuit-breaker oil can be purified and maintained in condition to assure safe operation at a cost of approximately 1½ cents per gallon, it is stated, through the use of the Sharples reclaiming process. This is a centrifugal process, which it is



Complete Sharples Centrifuge Breaker Oil Reclaiming Plant

stated may be used on circuit breakers, wherever installed.

The operation of this apparatus requires the services of only one man. The contaminated oil is pumped from the supply source at the rate of 150 gal. per hour, through four 6,000-watt heaters, to a 50-gal. mixing tank, where it is mixed thoroughly with the first reagent, with the aid of a motor-driven agitator. The resulting emulsion is fed into a super-centrifuge. The separator discharges the waste water containing some of the impurities, the solid impurities remaining in the bowl of the machine. The mixture is then treated with a second reagent in the second mixing tank and sent to a second super-centrifuge, and from there the purified oil is pumped to storage.



New Type Cowl Ventilator Incorporated in Body Construction for Buses

Association News & Discussions

Courage and New Equipment Accomplish Results in Grand Rapids*

BY L. J. DE LAMARTER

Vice-President and General Manager Grand Rapids Railway, Grand Rapids, Mich.

MANY electric railways are endeavoring to win back their old patronage by applying the automotive industry's methods, utilizing the engineer's skill, the master car builder's art, the painter's brush, and adding thereto the lessons learned from successful commercial institutions—courtesy and salesmanship.

Salesmanship of urban and interurban transportation today is one of the vital factors in the life of the industry. Upon it depends the necessary increased revenues, good will and good public relations, but which can only be secured when backed by dependable service. Platform men offer the important contact between the company and the public. Any one conductor or operator meets and serves in one day more customers than most salesmen approach in many days. This being so, unless we give the platform man the right kind of atmosphere and surroundings, a new uniform, a clean, attractive car, a vehicle in keeping with the quiet running automobile our patrons have become used to, a car the employee automatically takes pride in, he will unconsciously not be very enthusiastic in his salesman's efforts, and as a result the company will directly or indirectly suffer.

In Grand Rapids the installation of new and improved equipment with all the refinements and comforts enjoyed by automobile users, with fairly courteous and attentive salesmanship by our platform men, has been attended with very gratifying results. To a large degree it has proved that the combination of attractive equipment, new uniforms and a new order of things has brought—even in the face of a monthly average increase of approximately one thousand automobile licenses issued—splendid results in increased earnings and in the necessary public good will. At the same time operating expenses have been reduced due to the new type of car and the hearty co-operation of the operators, which is reflected in an earnest effort toward power saving and in other ways.

Along with many others, I had long thought that the old, obsolete type of street car could be and should be improved if the industry was to weather the automotive competition and survive. Why should the 1890 type of street cars be operated in these modern times? Why should the same noisy, lumbering

and unattractive car, lacking in comforts and refinements, continue to be operated when there were many opportunities for improvement? Why not adopt the same methods employed by the auto manufacturer and improve the type of street railway vehicle to meet the modern, popular demand?

With this in mind I went to Chicago and there met one of the leading car builders of the country.

"What have you that is new in car design?" I asked, after explaining my wants. The car builder reluctantly confessed that he had nothing new to offer. Still my idea, which seemed so simple, so natural and logical, obsessed me. It seemed to me that desirable changes in construction could be made comparatively easily.

Shortly after the meeting in Chicago, fire visited our Hall Street carhouse and destroyed more than 50 of our best cars. Our misfortune and adversity offered the opportunity for the new car design idea to be worked out. Again I conferred with the car builders, after conferring with my own engineers, and explained to them the kind of new electric rail coach I wanted.

I prevailed upon three car builders to enter one car each in a so-called com-

petitive test. Each car builder constructed a coach that he believed would meet with my ideas. The industry is well acquainted with these coaches—the "St. Louis," the "Ohio" and the "Minnesota," which were displayed at the Atlantic City convention in 1925 and which have finally furnished inspiration for many street railways throughout the United States.

Interest of the industry closely followed the coaches from the time of their first appearance until the consignment of 27 new coaches were received in Grand Rapids. Their favorable impression on the public and the practical results they produced to some extent at least has stimulated a general movement throughout the country for better equipment. Harmonious color combinations and other new features, such as low, rakish and streamline body, control cabinet concealing unsightly appliances, etc., easy steps, leather upholstered seats, plate-glass windows, smoking compartments, rubber tiling for floor covering, thermostat heat control and automatic treadle exit, automobile type of bumper, double headlights and names instead of number system are all distinctive features.

June 12, 1926, was set apart as a gala day, a real holiday, to view the parade of the 27 new coaches. Streets were jammed as they had not been since the historic Armistice Day in 1918; city officials, representative citizens, invited guests, descendants of pioneers and early residents for whom many of the new coaches were named, public and parochial school pupils proud of the cars named for their schools and adorned with their pennant dash designs and panel insignia, participated in the colorful pageant of modern street railway equipment. The next day the coaches were placed in service, being dedicated to Grand Rapids residents, and immediately became the pride of every citizen.

A few days later came the street car bonfire at the Fair Grounds. It was a jollification staged for the people by the Grand Rapids Railway to celebrate the new coaches, the beginning of a new era in local mass transportation and to usher in the new order of things. The celebration exceeded even the expectations of the company, more than 50,000 people jamming into the Fair Grounds to enjoy band concerts, illuminated balloon ascension, fireworks display and witness Mayor Swarthout and myself touch the torches at both ends of the line of cars that had outlived their usefulness.

The Grand Rapids Railway's records show an increase in patronage on the lines over which the new coaches are operating, as compared with the older type of car. This proves that giving the people a type of street railway vehicle to ride in, to which they have

COMING MEETINGS OF

Electric Railway and Allied Associations

Dec. 6-9—American Society of Mechanical Engineers, annual meeting, New York City, Engineering Societies Building.

Jan. 6-7—Midwest Electric Railway Association, midwinter meeting, Mayo Hotel, Tulsa, Okla.

Jan. 7—American Electric Railway Association, Metropolitan Section, Engineering Societies Building, New York City, 8 p.m.

Jan. 10-14—American Road Builders' Association, convention and road show, Coliseum, Chicago, Ill.

Jan. 25—New York Electric Railway Association, winter meeting, Hotel Commodore, New York City.

Jan. 26-28—Association of Equipment Men—Southern Properties—Memphis, Tenn.

Feb. 3-4—Central Electric Railway Association, winter meeting, Toledo, O., Commodore Perry Hotel.

*Abstract of a paper presented at the annual convention of the Operators' Section, Iowa Electric Railway Association, Nov. 17-18, 1926, Omaha, Neb.

become accustomed as a result of the more luxurious trend of the auto, will help restore our industry to the former place it held as a public transportation utility. We realize that civic pride in our railway system is the first step toward public friendship, patronage, fair franchise terms and adequate rates of fare, and our company has made every endeavor to improve the physical equipment with which it is rendering a regular, speedy and safe service.

A recent unsolicited statement by Mayor Elvin Swarthout that any street railway company's effort to improve its equipment, to progress and to give the best service possible is entitled to civic support, is proved by his words:

"The new coaches are more comfortable to ride in than the auto because

you have more leg room, more freedom, more comfort and less liability of accident. They are the safest place in the street." His tribute was concluded by this unusual declaration:

"The city must see to it that the railway company is sustained, even if it is subsidized by the city."

It is my firm belief that by progressiveness, courage and service along the lines pointed out the road and the future will become smoother and more cheerful, and with the new order of things, people will gradually return to the street car. Good-will is sure to be further strengthened and all the essential elements combined will help our industry to emerge from stagnation to its proper place in the transportation world.

Co-operation of the Transportation and Mechanical Departments*

BY E. W. MILLER

Superintendent of Transportation Des Moines City Railway, Des Moines, Iowa

TO GIVE first-class, uninterrupted street car service, there must be existing between the transportation and mechanical departments a true spirit of co-operation. Each department head should be sincere and conscientious in his work, and realize his full responsibility, having in mind that both departments are necessary and must function properly to obtain the results for which they are working. There must be a well-organized program of each department as to every-day customs and practices.

It is the practice of our company for the president, all department heads, company and city supervisors to meet on Tuesday of each week, and all questions that cannot be ironed out satisfactorily between ourselves are brought up at this meeting for discussion and decision. I wish to make clear that questions other than those in dispute are brought up at this meeting, as the president of our company expects each and every department head to be progressive and wide-awake enough to offer constructive suggestions and criticisms.

On our property we have a very definite understanding between the mechanical and transportation departments as to just what is to be done under certain circumstances. To illustrate, in case of a car derailment, when there is a question as to whether or not it was carelessness on the part of the crew, defective car wheels, trucks or other mechanical defects, or bad track, the crew is called in for questioning, the car is pulled off the road immediately, sent to the shop for a thorough inspection, as well as a thorough inspection of track conditions. Our object in this precaution is to do everything within reason to prevent a recurrence of such derailment.

The transportation department directs the operation of all snow sweep-

ers, which sweepers are manned by regular trainmen. The operation of all work trains and work of cleaning and salting switches are directed by our chief engineer, who has supervision of ways and structures. At the beginning of what may seem to be a snow storm, the transportation department immediately gets in touch with the weather bureau; and if it predicts considerable snow, the transportation department gets in touch with the chief engineer, and the heads of these two departments decide to what extent they will call out the snow-fighting force. It has been our policy in the past few years at the beginning of the storm to start our sweepers, work trains and a crew of men to clean

and salt switches. By following this plan we have experienced very little interruption in service due to snow storms. We always try to avoid operating snow sweepers during the rush hours, because during such periods it is impractical for the sweepers to keep in the clear of the passenger cars. During a snow storm, the lines are checked up carefully at regular intervals by two transportation men, who use autos for this purpose. If in their judgment a line needs a sweeper, they so advise the trainmaster, who directs the operation of sweepers.

If we call out our snow-fighting force say at 9 a.m., and the snow storm continues throughout the day, we would keep the full force going until about 5 p.m., at which time the sweepers would be pulled off the road until about 6:30 p.m. The force that sweeps, cleans and salts switches continues at work during the rush hour. Assuming the storm should break about 10 p.m., we would keep our sweepers out until all lines were fairly well cleaned up. After midnight the auto traffic and parked automobiles being off the streets, we would go over all lines with sweeper and clean the track thoroughly, clean and salt all switches, and have men on the job to note that everything is in first-class condition for the early morning cars. This method removes the snow from the rail and flangeways; but unless the snow is pushed back several feet from the rail, as soon as the auto traffic starts, they will crowd the snow back on the rail and in flangeways. We use a snow plow with a heavy wing about 10 ft. long and 2½ ft. wide on right side, set at an angle that it will push the snow about 5 or 6 ft. from the rail. This work must be done after midnight, as it is not practical to attempt this operation with automobiles parked along curbs.

Economic Situation of European Railways†

By L. BOULLE

Associate manager Compagnie Générale Française de Tramways of Paris

AND M. BOUTEAU

Manager Compagnie Générale des Chemins de fer Vicinaux of Paris

STREET railway enterprises in the cities of western Europe have been affected during the post-war period by a number of factors, including the following: (1) Increase in cost of labor and material, (2) adoption in a number of countries of a legal eight-hour day which has still further increased the hourly charge of labor, (3) a depreciated currency in many of the countries, (4) reduced riding in still other countries because of business depressions.

The information in this article is based on data received from 42 companies as follows: In Great Britain, 2; Belgium, 3; Denmark, 1; France, 20; Holland, 4; Italy, 1; Luxembourg, 1; Poland, 1; Roumania, 1; Spain, 1; Sweden, 1; Switzerland, 6. In most cases, they represent the largest railway systems in the several countries mentioned.

For convenience in the following comparisons, these undertakings have been divided into two groups. The first

are the properties in those countries where the exchange value of the currency as compared with the American dollar is now at par or almost at par. These countries are Denmark, Great Britain, Holland, Spain, Sweden and Switzerland. The second group includes the properties in countries where the currency is greatly depreciated, as compared with the American dollar. These countries are Belgium, France, Italy, Luxembourg, Poland and Roumania. The work of the authors has been somewhat complicated because of the incomplete data received from a number of the properties, as well as because of variations in methods of keeping records and in the nomenclature adopted for accounts. The results given in the accompanying tables, therefore, can be considered only ap-

†Abstract of paper presented at the biennial meeting of Union Internationale de Tramways, de Chemins de fer d'Intérêt local et de Transports Publics Automobiles, Barcelona, Spain, Oct. 10-16, 1926.

*Abstract of paper presented before the annual convention of the Operators' Section Iowa Electric Railway Association, Nov. 17-18, 1926, Omaha, Neb.

TABLE I—SHOWING CURRENCY EXCHANGE RATIOS AND PRICE INDEXES FOR THE COUNTRIES MENTIONED

Group 1	Exchange Ratio of Paper Currency in U. S. A. Dollars			Price Index of Commodities on the Basis of 1914 = 100.6			
	1913	1919	1925	Wholesale		Retail	
				1919	1925	1919	1925
Denmark.....	3.73	5.27	4.02	340	157	212	210
Great Britain s..	4.86	4.40	4.81	307	160	215	173
Holland.....	2.49	2.66	2.49	304	155	195	179
Spain.....	5.18	5.25	7.05	204	188	174	189
Sweden.....	3.73	4.68	3.73	330	155	257	176
Switzerland....	5.18	5.43	5.17	d 191	161	261	165
Group 2							
Belgium.....	5.18	10.36	22.01	d 368	565	d 468	534
France.....	5.18	10.99	26.81	356	555	238	399
Italy.....	5.18	13.07	24.79	366	690	280	598

a.—In the case of Great Britain the exchange rate given is the value of the pound sterling in American dollars. In the case of the other countries, the figure represents the number of units of currency of the country required to equal the value of an American dollar.

b.—Wholesale prices are 1913 instead of 1914 for

Great Britain, Holland, Italy and Spain. For Denmark and Sweden some wholesale prices are for 1912 and 1913. In the table of retail prices the figures for Great Britain are for 1913 and for Holland are for 1911-1913.

c.—1920.

d.—1921.

proximate. These tables include in Group 2 only Belgium, France and Italy, as the data from Luxemburg, Poland and Roumania were not complete and also because the great changes in currency of Poland and Roumania made the statistics from those countries especially difficult of comparison.

As a preliminary, Table I is given to show the economic and currency situations in the countries mentioned.

FLUCTUATION IN GROSS RECEIPTS

A somewhat corresponding variation to the figures in Table I will be found in an examination of the gross receipts of the electric railway undertakings in the countries mentioned, though differing greatly in the two groups mentioned. Thus, the gross receipts of the railways in Group 1, with the exception of those in Spain, show a fairly continuous trend. This trend can be divided into three parts as follows:

From 1913 to about 1918 or 1919 there was a gradual but continuous increase in gross receipts, amounting to approximately 30 per cent at the end of the period as compared with 1913.

From 1918 to 1921 there was a very rapid increase in the gross, resulting in 1921 in receipts in some cases double those of 1913.

From 1921 to 1925 there has been a gradual decrease in gross receipts of the properties in Denmark, Great Britain, Holland and Switzerland, and a gradual increase in Spain.

It is not difficult to explain these variations. During the war, even in the neutral countries, there was an abnormal activity of affairs which interfered with the ordinary development of traffic. Immediately after the armistice this condition subsided, but the restraints on general travel, which had existed in many countries during the war, were removed. This with the increased fares, which had been raised because of the depreciation in the currencies, accounts for the greater receipts. It should not be forgotten,

also, that in Denmark, Great Britain, Holland and Sweden, the wholesale price index of commodities in 1919 was two or three times that in 1914. In Spain the increase in the index price of commodities was not so great, so that during the last seven years, it did not have so far to fall. It is not surprising therefore that the slight decrease in receipts in England, Denmark and Holland should have been accompanied by a slight increase in Spain.

GROSS RECEIPTS IN COUNTRIES WITH DEPRECIATED CURRENCY

All of the countries in the group in which the currency has greatly depreciated were belligerents during the war, and in most of the tramway enterprises in these countries, the receipts fell off during the war period, but in the period 1919-1921, the effects were largely similar to those in the enterprises in Group 1. Thus, in 1921 the receipts, on a basis of 100 for 1913, were in Belgium 249, in France 237 and in Italy 438. At the same time the wholesale price index for commodities was, in Belgium 565, in France 555 and in Italy 690.

Professor Seligman to Address Taxation Committee

A MEETING of the taxation committee of the American Electric Railway Association has been called for 11 o'clock Friday morning, Dec. 10, at association headquarters to discuss specifically the merits of the proposed gross-net tax method of utility taxation. In addition to the committee membership proper, the advisory members representing each state in the country have been asked to attend.

The committee will hold a luncheon meeting at the Engineers' Club at 1 p.m., Friday. Edwin R. A. Seligman, professor of economics at Columbia University, has been invited to talk on the general subject of public utility taxation, to which he has given much study and on which he is a widely recognized authority.

Since the subject is of vital importance to the entire industry, Leslie Vickers, economist of the American Electric Railway Association, is strongly urging every member of the committee and of the advisory group to attend this meeting.

ties was, in Belgium 368, in France 345, and in Italy 577. For 1925 the conditions were even worse, as shown by the figures, in Table II.

OPERATING EXPENSES AND RETURN ON CAPITAL

Table III gives average increases in operating expenses in the two groups, as compared with 1914. Operating expenses do not include any return on capital. As will be seen, with the exception of Sweden, there has been a tendency for operating expenses to fall to from about 240 to 260 per cent of the 1914 value.

TABLE III—OPERATING EXPENSES OF TRAMWAYS IN THE CURRENCIES OF THE DIFFERENT COUNTRIES COMPARED WITH 1914

Group 1	WITH 1914		
	1914	1921	1925
Denmark.....	100	...	299
Great Britain..	100	239	253
Holland.....	100	309	211
Sweden.....	100	555	424
Switzerland...	100	247	240
Group 2			
Belgium.....	100	506	659
France.....	100	396	624
Italy.....	100	316	457

The return on capital in Great Britain in 1921 was 40 per cent of the return in 1913, and in 1924 it was 99 per cent. If, however, the reduced purchasing power of money in Great Britain is taken into consideration, the average return for the post-war period may be taken as averaging about 30 per cent of the period just prior to the war. The same condition holds in Holland. In Switzerland the situation is somewhat better. The return in 1921 there was from 150 to 190 per cent, and in 1925 from 125 to 180 per cent of the return in 1913.

In the countries with depreciated currency, the returns are far less. Nominally, the French figures show the return in 1921 to be from 100 to 140 per cent of the 1913 figures and in 1925 from 95 to 130 per cent. The figures, however, take no consideration of the devalorization of the franc.

CONCLUSIONS

In general it will be seen that while the properties are holding their own on the basis of traffic, the financial returns are not satisfactory and the net returns, especially in those countries where the currency is depreciated, are most discouraging to this class of enterprise. Possibilities for improvement seem to lie, if at all, in a more efficient utilization of the personnel, in improved types of rolling stock and in more scientific methods of operation. Undoubtedly, in an industry where the labor charge amounts to 50 or 60 per cent of the gross, as it does in tramways, a great deal of harm can be caused by ill-considered legislation in regard to minimum wages and maximum hours. Any such legislation which includes personnel of a local transportation company should take into consideration not only the number of hours worked per day and week, but also the intensity of the physical and intellectual effort demanded.

In the direction of improved rolling stock, the cars used at present by the electric railways of western Europe have been designed largely along the

TABLE II—PERCENTAGE CHANGES BETWEEN 1913 AND 1925

	Gross Receipts	Devalorization of Currency		Wholesale Price of Commodities
		1913	1925	
Belgium.....	450	426	565	
France.....	400	517	555	
Italy.....	440	478	690	

lines of steam railroad coaches. The rapid development of the automobile industry indicates that possibilities of improvement lie in the direction of cars patterned more along automobile lines, particularly in the direction of lightness. Unfortunately, any ex-

tended change in this direction would involve large expenditures which the industry can ill afford at present.

The greatest possibilities in improvement of operation seem to lie in more careful adjustment of schedules with the thought of economy in mind.

Barcelona Convention Attracts Large Attendance

MORE than 500 attended the Barcelona convention of the Union Internationale de Tramways, de Chemins de fer d'Intérêt local et de Transports Publics Automobiles, held Oct. 10 to 16. This association is made up of electric railway companies and municipal tramway undertakings in western Europe and the governments in a number of countries send official delegates to the meetings. The proceedings are conducted in French and a convention is held every other year. The one in 1924 was in Paris. The president of the association is F. de Lancker of the Brussels Tramways. The Barcelona meeting was honored at its last session by the presence of his Majesty King Alphonso, who expressed his pleasure that Spain had been selected for the 1926 convention and that he personally had been able to be present at one of the meetings.

At the business session of the association no changes were made in the executive committee with the exception that Gosta Hellgren of Stockholm was elected to represent Sweden, Alphons Kuhn of Warsaw to represent Poland and Andreas Falkenberg of Lilleaker to represent Norway. Messrs. Kuhn and Falkenberg occupy vacancies caused by the deaths of the former representatives of Poland and Norway. Invitations to hold the 1928 convention in Warsaw, Glasgow and Rome were received from representatives of those cities, but decision was left to the executive committee.

An abstract of one of the papers presented at the Barcelona convention, namely, "Transportation a Vital Factor in City Growth," by M. Jayot of Paris, was published on page 889 of the issue of this paper for Nov. 13, 1926. An abstract of a paper on "Economic Situation of European Railways," by L. Boule and M. Bouteau, Paris, appears elsewhere in this issue. A paper on "Bus Body Design in Europe," by J. de Croes of Belgium, was printed in abstract on page 643 of *Bus Transportation* for November, 1926. Abstracts of papers on "Methods of Increasing Car Speeds and Rush Hour Carrying Capacities," by Paul Mariage of Paris; on "Track Switches," by Messrs. Battaille of Liège and Stoffels of Amsterdam, and on "An Index to Determine the Proper Tramway Fare," by R. Haerens of Brussels, and a progress report on rail corrugation will be printed in early issues of this paper. Three extended reports on rail cars for steam railroad service formed part of the program. Abstracts follow of other reports presented:

EUROPEAN PRACTICE ON TIES

This report was presented by Mr. Burton, principal assistant engineer

Société Nationale des Chemins de fer Vicinaux of Brussels. Based on replies from 31 companies of the international association, the following conclusions were reached on the subject of ties for electric railway track.

Wood Ties.—Wood ties do not appear to be inferior from a service standpoint in electric railway track construction. On the contrary, the wood tie, particularly if of oak, has no superior as a support for the rail. Beechwood ties also give good service, though do not appear generally to have the good reputation which they deserve. This wood is indigenous to central and western Europe and could be employed instead of oak to good advantage. Certain other kinds of wood could also be employed to good advantage. The comparatively short life of pine ties, even when treated, does not seem to encourage their use except under especially favorable conditions. In general, preservative treatment is to be recommended, not only from the standpoint of economy but in the interests of conservation. In track replacements, it is rarely desirable to attempt to reuse the old ties.

Metal Ties.—The greater life of metal ties warrants their use at a price higher than that paid for wood, especially when native woods are not very suitable for ties. Metal ties can generally be reused.

Concrete Ties.—The use of concrete ties is too recent to permit any definite statement on their value, but from a service standpoint they are suitable for use on ballast.

General.—The weakest feature of all types of substitute ties mentioned is the method employed to attach the rail to the ties. In this respect there is little to be said in favor of one type of tie over another. Rail corrugation appears less when the rail is supported on an elastic rather than on a rigid continuous foundation.

Ballast.—Metal ties are not very suitable where the ballast is of a type having an oxidizing effect on metal, like cinders. They also seem to have more of a crushing effect on broken stone ballast than wood ties.

SAFETY IN CAR OPERATION

A report on safety was presented by O. Junyent of the Barcelona Tramways, who pointed out that much less attention has been given to this subject on European tramways than by those in the United States. In the way of safety equipment, European tramways realize the necessity of good brakes and fenders and use safety guards between motor cars and trail cars, but few cars are equipped with platform gates or doors. In fact, the only cities reporting their use are London, Amsterdam and Barcelona. Some

systems even permit entrance and exit of passengers on both sides of the car on a double track.

While thus somewhat lacking in the use of mechanical equipment, most European systems pay a great deal of attention to the selection and medical re-examination of employees. The rule in Paris is to give motormen a thorough physical examination every five years up to the age of 45, then every three years between 45 and 54, and yearly thereafter. The Paris system also gives a very thorough psychological test to motormen, as described in a report at the last convention. (See *ELECTRIC RAILWAY JOURNAL* for Aug. 23, 1924, page 280.) At present 22 per cent of the motormen have been selected by this method, and statistics show that they have 16½ per cent fewer accidents than motormen not so chosen.

Fourteen companies of those reporting offer prizes to the motormen who have no accident records. Lyons has instructed its street inspectors to call the attention of passengers who attempt to alight from or board a moving car to the danger of this practice. A number of companies use safety posters.

The report contains a table showing average speed of cars in kilometers per hour and the number of accidents per 100,000 km. operated.

AUTOMATIC SUBSTATIONS

Two papers were presented on this subject. One, by M. Lombard-Gérin of the Lyons Tramways, said that automatic substations are comparatively more rare in Europe than in America, one reason being that in Europe labor is comparatively less expensive and automatic equipment comparatively more expensive than in America. However, a number of railway companies, including those at Vevey, Paris, The Hague and his own company at Lyons had installed stations of this kind. The Lyons station transforms three-phase, 10,000-volt, 50-cycle current to 440 volts d.c. and is of 900 kw. nominal capacity, though capable of working from 15 to 20 per cent overload. The converters are of the mercury arc rectifier type. In a paper on mercury arc rectifiers, M. Walty of Brown-Boveri & Company said that his company had equipped and had in service 25 substations, all with mercury arc rectifiers, and that they were giving good satisfaction. He considered that type of rectifier especially adapted to automatic substations.

RAILWAY MOTOR RATINGS

This topic was also considered in two reports. One, by Professor Podoski of Warsaw, gave particulars of tests made by him on six different types of railway motors used on the Warsaw and Lwów systems in Poland, tending to show the effect of passenger stops, grades, forced ventilation, etc., on motor outputs. The other paper on standardization of railway motors, by M. Peridier of the Paris Tramway Company, outlined the conditions which railway motors are required to meet in service. He urged greater participation by electric railway engineers in the work of the International Electrotechnical Commission, which has practically assumed charge of the subject of railway motor ratings.

The News of the Industry

Bus Franchises Delayed— Jurisdiction Questioned

An opinion on the powers of the Transit Commission to fix fares on bus lines operated under a municipal franchise was recently rendered by Judge Charles E. Hughes, speaking in a private capacity. An expression of his judgment was sought by the Brooklyn-Manhattan Transit Corporation, Brooklyn, N. Y., which took exception to the form of franchise of the Board of Transportation requiring the carrier to agree not to invoke the authority of the Transit Commission in the matter of a maximum fare under penalty of forfeiture of its franchise. Mr. Hughes asserted that the city could not fix a 5-cent bus fare, but that the Transit Commission had sole power to make rates.

He contends there would be no forfeiture of franchise if the rate should be raised on the company's appeal. He held that the city derives its authority to prescribe terms contained in franchises from the Legislature, and has no power to fix rates, as this function is exercised by the Transit Commission, with its authority over "common carriers." Admitting that the Transit Commission fixes only maximum rates, Mr. Hughes contended that any effort by the city to fix a fare which the Transit Commission might hold as unreasonable would be invalid.

This opinion, filed by the Brooklyn company with the Board of Estimate, may delay further the awarding of the bus franchises. Mayor Walker expressed the thought that if the provision in the proposed franchise which fixes the rate of fare at 5 cents and binds the holder not to appeal to the commission is not legally binding, the law should be amended to give the city that power. John H. Delaney, chairman of the Board of Transportation, said that if Judge Hughes were correct in this matter, the alternative would seem to be municipal operation.

No comment on Mr. Hughes' bus opinion could be obtained from the Transit Commission.

Kansas City Canvass Under Way

Official canvass is being made of the 13,218 names on a petition filed recently by a committee of Republicans asking for the referendum or repeal on the twelve-year franchise extension of the franchise of the Kansas City Railways, Kansas City, Mo. A total of 11,461 names is required if the petition is to be allowed to stand, it is announced. If the striking off of the names brings the total below the required number, the committee is allowed ten days to add other names to bring it up to the required amount. H. F. McElroy, city manager, stated

that fraud apparently had been committed, judging from the similarity of the handwriting of many of the names, and urged that a representative be sent to watch the official canvass. P. E. Cole, former bank auditor, was sent to aid the city clerks in the check of the names. Republican workers are busy now obtaining names to replace the 5,000 stricken from the petition by the city clerk, who held they were not qualified voters and were not signed properly to the petition.

New Nashville Cars in Movies

Movies were made at Nashville, Tenn., of the old mule car, carrying its load of old-time drivers; the new railway parlor coaches and all of the ceremony attendant upon the presentation of the new de luxe cars to the public of Nashville.

Through the courtesy of Tony and Harry Sudekum of the Crescent Amusement Company, a motion picture cameraman "shot" more than 1,000 ft. of film, from the time the parade began until Vice-President J. P. Brown of the Nashville Railway & Light Company, formally presented the new cars to Mayor Hilary E. Howse for public service.

The film reveals the thousands who lined the downtown streets to view the unusual procession, shows the new cars moving in a fleet through town and contains many intimate glimpses of "old timers" who lined the sidewalks and the electric car which was born in 1889. The pictures will be preserved as a part of Nashville's interesting history.

Electric Railroads Can Make Money!

ACTIVITY shown by the Insull interests in adding to their holdings of electric transportation lines in recent years indicates great confidence in the belief that electric railroads can make money under proper management. Taking the North Shore line as a sample of Insull-Budd management it would seem that properties under their control should make money, if any management could do so in a given situation. A glance at the map raises the question whether it may not ultimately be the Insull policy to unite the properties in the Chicago area into a comprehensive system. To this question there can at present be no answer. Studied as a group, however, it is apparent that the securities of the various companies include a number of sound investment issues and some attractive speculations.—*From an Article in Barron's entitled "Insull in Transportation."*

Chicago Mayor Opposes Receivership

In bringing forth a proposal to extend the franchise of the Chicago Surface Lines, Chicago, Ill., for six months after their expiration next February, Mayor Dever recently told the local transportation committee of the City Council that a receivership would be detrimental to the interests not only of the bondholders but of the city and car riders as well. He pointed out that the State Legislature, which convenes in January, will conclude its 1927 session on June 30 and that the city by that time would have had time to adopt a satisfactory traction ordinance and obtain the legislation required to permit unification of the elevated and surface lines.

Alderman Arvey presented to the Council a resolution requesting the transportation committee to consider the matter without delay. He said he believed that Surface Lines officials and bankers were bluffing the security holders into believing no course other than receivership was open to protect them. He said that with a short extension of franchise there would be no doubt about the city continuing to get the 55 per cent of net receipts or the security owners getting their interest payments. Neither of these things would be realized under a receivership. The move would insure the continuance of the 7-cent fare over the city and free interchange of transfer.

Mayor Dever's chief purpose in appearing before the local transportation committee was to push his plan for the immediate building of subways in the Loop district and the adoption of an ordinance providing for the levying of special assessments and their confirmation by the courts.

The Mayor hopes that the execution of such a plan will place the city in readiness for actual digging of the tubes as soon as the settlement of the whole transportation question is reached. He believes it is unwise, however, to start actual construction involving the expenditure of a part of the city's traction fund until the entire traction situation is cleared up.

Representatives of the Wells Street property owners' association were also on hand at the transportation committee's meeting to urge that the "L" structure on Wells Street in the Loop be removed and replaced with a subway. They offered to stand immediate assessment for a share of the cost of both operations.

The so-called Lisman proposal, particularly the financial features of it, continues to be the subject of much discussion in banking and investment circles. This plan has more recently been broadened in discussion to contemplate one ownership for both surface and elevated properties.

New Line Proposed for San Francisco System

Men in public life at San Francisco, Cal., are working on a plan to construct a fast interurban line for train service from the heart of the business district down the peninsula to San Mateo. It is planned to operate five-coach trains on a twelve-minute headway to make the trip in 21 minutes. It is declared that such a project will open up the whole picturesque region south of the city to home settlement, give the city room for natural expansion and boost retail trade.

City Engineer M. M. O'Shaughnessy has compiled a mass of data to aid him. Tracks are already laid as far as Ocean View, 12 miles from San Mateo. It is estimated that \$5,000,000 will be sufficient to construct this new line. A charter amendment voted by the people permits the county to build a railroad as a public utility into an adjoining county and recent approval of another charter amendment, it is said, will enable officials of the city to float a \$5,000,000 bond issue.

It is claimed that lack of adequate rapid transit down the peninsula has tended to stunt the growth of San Francisco. The proposed line would be an adjunct to the present San Francisco Municipal Railway. It is declared that the work could be completed in eighteen months, but it is not likely that the project will be started until after some existing Market Street Railway franchises have expired, which will not be before two years.

Mr. O'Shaughnessy has two sets of plans for a San Francisco terminal. One is to form a loop at Stockton and Market Streets and the other is to utilize a building similar to that used by interurban trains in Los Angeles.

"I." Lease Hearings to Reopen

An investigation into the figures compiled by the Philadelphia Rapid Transit Company, Philadelphia, Pa., in support of the city-company petition for approval of the Frankford elevated lease was begun in Philadelphia on Nov. 26 by B. F. Morgal, chief of the Public Service Commission's accounting bureau. He has been directed by the commission to aid counsel for certain objectors to the 30-year extension of the lease for the city-built line, in computing exact operating costs of the elevated. The commission announced that hearings would be reopened on Dec. 9.

Opponents of the city of Philadelphia lease with the Philadelphia Rapid Transit Company for 30-year operation of the Frankford elevated line engaged Milo R. Maltbie recently to aid in the fight being waged against ratification before the Public Service Commission. Mr. Maltbie, a utilities expert of New York, headed the commission named by Mayor Moore to plan a comprehensive system of high-speed lines for Philadelphia. When counsel for the P. R. T. and for the Northeast Chamber of Commerce, City Club and United Business Men's Association met on Nov. 29 to thresh out certain data which had been requested by the commission, two of Mr. Maltbie's assistants

appeared at the conference. They are George E. Goldwithe, engineer, and Francis T. Mylott, accountant. Edward E. Roberts, engineer, representing the United Business Men's Association, also was present.

Survey in Detroit

Police Traffic Bureau Suggests Certain Corrective Measures, Though Certain Minority May Be Inconvenienced

A police traffic survey of Detroit, Mich., is now under way which has for its purpose the more efficient and consistent use of the facilities now available. The City Council has voted \$30,000 to defray the cost of the survey. The Police Traffic Survey Bureau believes that when the limit of such facilities is in sight plans will have been made for amplification of or additions to them, as required.

If a program of corrective measures is not adopted the only alternative is more ordinances, more policemen to try to enforce them and large sums of money spent for street widenings, arcaded sidewalks, double-deck streets, double-deck sidewalks and many other schemes suggested, all of which cost money and require time for installation.

The following seventeen items show the scope of the work.

1. Determination of vehicular traffic flow and passenger flow at four concentric loops, having the City Hall as an approximate center; supplemented by vehicular traffic flow at isolated intersections throughout the city. Included therein is the timing of the automatic signals now in use and a determination of where additional signals should be located.

2. Determination of points within the city where minor changes, such as cutting back curbs at intersections, removal of billboards and repairs to paving, might reduce the accident hazard and increase the fluidity of traffic movement.

3. Determination of the origin, destination and routes of passenger and commercial vehicles in order to devise, if possible, selected preferential routes for both classes of service.

4. Determination of the relative speeds of street cars, buses, trucks, passenger automobiles and horse-drawn vehicles in different sections of the city and along certain streets, especially the main arteries, in order properly to time and operate the progressively timed automatic signal system now being developed by the signal bureau of the Police Department.

5. Determination of the routes selected by trucks in moving freight and merchandise between freight terminals and the business district and between the business district and residential district.

6. Determination of the use of the alleys in the business district for freight loading and unloading, with the possibility of increasing the use thereof, with a consequent reduction in the use of street space for such purposes.

7. A study of the present routing and loading points of mass transportation vehicles with a view of improving the same where possible.

8. Determination of the origin, destination and routes taken by passengers on mass transportation vehicles with a view of improving the efficiency of the same, where possible.

9. A study of the routes, street stands and movements of "for hire" vehicles.

10. A study of pedestrian movements, direction and volume, at certain congested intersections and along certain congested sidewalks.

11. In co-operation with the Retail Merchants' Association, a survey and study of the transportation habits of customers and employees to and from the stores in the downtown district.

12. A study of the transportation habits of factory employees, store employees to and from work.

13. In co-operation with the Detroit Automobile Club a study of the distribution of automobile and truck ownership in the city.

14. In co-operation with the Associated Technical Societies of Detroit and the Retail Merchants' Association, a study to

determine whether or not there is a tendency toward decentralization of the downtown business district.

15. Study of the available "off street" parking space inside the limits of the Grand Boulevard and a determination of the amount and turnover of automobile curb parking in the business district.

16. Study of the available rentable garage space outside the business district and the amount of all-night street storage of automobiles in that territory.

17. In co-operation with the Board of Education, a study of the travel routes of children to and from school in order to provide the necessary protection, such as traffic officers, automatic signals and pedestrian subways where major streets are crossed by the children.

Before the work in hand is completed, city departments and civic organizations will be asked to lend their assistance. In making this survey the Police Department has staged an "open house" policy as regards suggestions for the betterment of traffic movement and control.

New York Comptroller Asks Some Pertinent Questions

Comptroller Charles W. Berry of New York insisted on Nov. 22 on having an answer to the subway questions which he propounded to the Board of Estimate more than four months ago. Until the present administration has settled upon a definite program, he said, he will not vote one cent of money for subway contracts.

The city will be in a position within a few weeks to let \$50,000,000 of subway contracts which have been held up pending determination of the proceedings over the prevailing rate of wage law. Before these contracts are let Comptroller Berry will again demand to know how the subways are to be paid for, whether the plan inherited from the Hylan administration will be adhered to and how the subways, when completed, will be operated. He said:

Members of the Board of Estimate who are responsible for this vast expenditure of money should sit down and count the cost to see how the city is coming out. What we are doing is going right ahead as though there had been no change in the administration. We are committing ourselves to an independent subway.

Further, the comptroller pointed out, subway financing overshadowed all other questions of city finance and there could be really no determination of other pending problems until the subway question had been settled. He said he had no brief for any particular policy, but declared he could not see how the city could go ahead with any of its other projects until the main question had been settled.

He favors the immediate appointment of a board of expert engineers to examine the proposed plan before further expenditures are made on the system, which, he says, will eventually cost \$1,000,000,000 rather than the \$500,000,000 or \$600,000,000 which it was first planned to spend.

Mr. Storrs Back in America

Lucius S. Storrs, managing director of the American Electric Railway Association, returned on Nov. 30 on the *Olympic* from his seven weeks trip to Europe. While this was primarily a vacation, Mr. Storrs took occasion to look over the transportation situation in London, Berlin and various other cities.

Improved Business in Alliance

Use of Weekly Pass an Important Factor in Better Conditions on Eastern Ohio Line—Minimum Fare of 10 Cents Sought

Business Boosters—that's what officials of the Stark Electric Railroad, Alliance, Ohio, consider passes now in use over the company's lines from Canton to Salem, a distance of about 30 miles. Eight kinds are now being issued for transportation over various parts of the division. "I want to thank you from the bottom of my heart for your passes," a prominent Alliance lawyer recently told one of the company officials. "Formerly I spent 25 cents a week for street car tickets, walking to and from work most of the time. Now I buy a pass, use it four times a day, one of the children uses it at night, all for 70 cents. Where you formerly got 25 cents of my money you now get 70 cents."

PLAN PERFECTED IN SUMMER

Plans for using the pass were perfected last summer. That form of transportation was introduced first on Sundays at 50 cents for adults and 25 cents for children. The pass permitted a person to ride as often or as far as he wished. Results indicated that the idea was a good one, for on the first Sunday 400 passes were sold. Results were so promising that the company put into effect similar passes. They are:

Weekly pass between Canton and Salem, transferable to any member of the family, \$5; single fare between these two points is about 90 cents.

Weekly pass between Canton and Louisville, 5 miles, \$1.

Weekly pass between Alliance and Sebring, 4 miles, \$1.

Weekly pass between Damascus and Salem, 6 miles, \$1.

Weekly pass in Alliance, 70 cents.

Weekly pass in Canton, 70 cents.

School tickets for children under thirteen, good for ten rides to any point on the line, 50 cents.

Sunday passes for adults at 50 cents and children 25 cents.

So popular has the weekly pass system become on city runs that Stark Electric officials offer to insert in the city franchise a clause which will permit the issuance of passes for the remainder of the 25-year period for not more than \$1 a week. The present price of 70 cents a week will not be affected by this clause at the present time. The dollar price is made to permit an increase of the present rate should this be found necessary within the next 24 years.

The peak of the pass system so far recorded shows that more than 700 weekly tickets were issued in Alliance alone.

COMPANY A PASS PIONEER

The Stark Electric Railroad was the pioneer in eastern Ohio to adopt this system. Not many weeks later the Youngstown & Ohio River Line adopted a similar proposition, offering passes for 50 and 25 cents. After a month of this the price of the Youngstown & Ohio passes was increased to \$1.50 a pass, due to the length of the ride. The line is longer than the Stark Electric and has no intermediate city like Alliance to shorten the average length of ride. Since September, also, the North-

ern Ohio Power & Light Company, Akron, has been offering Sunday passes on its southern division between Canton and Uhrichsville.

The latest development in Alliance is a petition of the company before the City Council looking toward a minimum fare of 10 cents. This move is to relieve congestion on interurban cars which has resulted from large city patronage. This minimum fare, if approved by Council, will affect only the Mount Union branch of 2 miles, over which city and interurban cars operate. The same fare, 6 cents, which is charged on city cars will apply on interurban cars operating over city lines where there are no city cars. Three city cars are to be used instead of the present two cars for the Mount Union district if the minimum fare is allowed by Council.

STOPS BEING ELIMINATED

To speed up interurban service between Canton and Salem, a distance of about 30 miles, two city stops in Alliance and five in Canton are being eliminated. The Stark Electric "city zone" in Canton has been "moved in" toward the public square about half a mile. The new zone where the 6-cent fare will prevail ends at the old city limits.

House-to-House Canvass in Alameda

Officials of the Key System Transit Company, Oakland, Cal., have resorted to the plan of a house-to-house canvass in order to determine what the public needs in railway service in Alameda, Cal. Canvassers of the company have been instructed to visit every home in the island city and to make a complete report of all criticisms and concrete suggestions that may be offered. George H. Harris, general manager of the company, hopes by this means to obtain suggestions that will make it possible for him to readjust matters so as to stimulate riding.

They Had to Keep Their Cars Up

TIME payments have even had an influence on the painting of street cars. An electric railway in the Middle West a short time ago emerged from financial difficulties to an extent that permitted it to buy some new cars. After only a year of service the new equipment appeared resplendent in fresh-paint jobs, while the older cars have never been painted within the memory of man and apparently will always rattle through the streets in dreary coats of rust.

An observant passenger finally noticed a brass plate on each car which said: "Trust Company, Trustee, owner and lessor." The cars were financed with equipment trust notes and there is a clause in the agreement requiring that the cars must be properly maintained to keep the sheriff away. — *Wall Street Journal*.

Seattle Rides Free for Two Days

For two days, Nov. 26-27, the Seattle Municipal Street Railway, Seattle, Wash., furnished free transportation between the hours of 9:30 and 10:30 in the morning, to co-operate in the opening of the Christmas shopping season in the downtown district. The merchants of the city, working with the retail trade bureau of the Chamber of Commerce, decorated the streets in the business district with a lavishness heretofore unknown to the thoroughfares, and special preparations were made in all the stores for the entertainment and amusement of children, who were urged to go downtown to view the displays.

In the meantime, the merchants in the suburban district, especially the large University and West Seattle district, protested to the City Council against the free rides, declaring the plan gave the downtown merchants an unfair advantage and was a plot to draw business from the suburbs. The merchants of course rented the municipal lines at a set sum.

Increased Rates for Watertown Sought

The Black River Traction Company, Watertown, N. Y., applied to the Public Service Commission on Nov. 18 for authority to increase its fare rates from 7 cents cash or 16 tickets for \$1 to 10 cents cash, seven tickets for 50 cents. The company alleged that for more than three years past over and above expenses of operation, taxes, and interest, it had sustained a deficit for each year and that present revenues were insufficient to meet the cost of service. The Watertown City Council recently waived franchise provisions and consented to the increased fare on determination by the commission, with certain stipulations as to transfer privileges. The company also petitioned the commission for authority to discontinue the sale of the 15-cent round-trip tickets between Watertown and Glen Park, stating that the rate was unjust and unreasonable. It asked permission to charge a 10-cent fare between the two places.

A petition was also filed by the Watertown Transportation Company, a subsidiary of the Black River Traction Company, for authority to increase its fare rates to 10 cents cash fare, seven tickets for 50 cents. The Watertown City Council waived objection to the requested increase on Oct. 18. Certain transfer conditions were provided under this consent. The present bus fare is 7 cents, four tickets for 25 cents.

Los Angeles Will Oppose Fare Pleas

The city of Los Angeles, Cal., is preparing itself to fight the proposal of the Los Angeles Railway and the reported petition of the Pacific Electric Railway. The Los Angeles Railway has placed a request on file with the State Railroad Commission for a raise in rates from 5 to 7 cents. This petition has been referred to previously. It is stated, also, that the Pacific Electric Railway intends to seek another increase in its fares.

Chester Electrification Ready in Year

Assistant Chief Engineer E. B. Temple of the Pennsylvania Railroad, in an address delivered at a meeting of the Engineers' Club at Philadelphia recently, gave a number of details regarding the railroad company's plans that had not been generally known. He said it will be necessary to have all suburban trains electrified so that they may use the subway and the new Fifteenth Street station under Pennsylvania Boulevard.

To relieve congestion in the handling of trains in Broad Street Station, the company electrified the Main Line to Paoli, a distance of 19.9 miles, in 1915. The electrified service now consists of 36 trains each way daily, or 72 in all. In 1918 the Chestnut Hill branch, 12 miles in length, was electrified, and in 1924 the Fort Washington branch, 6.3 miles in length, beginning at Allen Lane station on the Chestnut Hill branch. The service now consists of a total of 88 electrified trains, counting both directions.

On Jan. 27, 1926, the board authorized the electrification of the suburban service to Wilmington, a distance of 28.1 miles, and to West Chester via Media, a distance of 27.4 miles. Telegraph and telephone and certain signal lines between Philadelphia and Wilmington are being removed and replaced by cables in underground conduits. This work is practically completed.

The rest of the job is progressing steadily. The foundations for the cross-catenary suspension and the bridges are nearly all completed on the Wilmington line, and plans are ready to proceed on similar foundation work on the West Chester line.

There are now 138 passenger and baggage cars in use on the Paoli and Chestnut Hill lines. There will be 128 additional cars ready for the Wilmington-West Chester electrification of about 50 trains for Wilmington and 40 to West Chester. A growth in travel is anticipated similar to that which took place after the Paoli and Chestnut Hill electrification. It is expected that the suburban service on these two lines will be operated electrically early in 1928. There yet remains the electrification of the Schuylkill division to Norristown or Phoenixville, and the New York division.

California Surveys Portend Structural Changes

J. H. Dyer, general manager of the Southern Pacific Company, San Francisco, and C. O. G. Miller, president of the Key System Transit Company, Oakland, Cal., admit that surveys are in progress to devise means to eliminate duplication of service on the ferry and traction divisions of the two roads. Five plans are being studied, ranging from slight changes in the interurban traction service to the organization of a joint operating company. As yet nothing definite has been decided. Paul Shoup, executive vice-president of the Southern Pacific, at present in the East, will have the final say.

The two roads now operate parallel lines in Oakland and in other East Bay cities and ferries on a similar schedule between San Francisco and Oakland.

Colorado Line Incorporated

The Grand River Valley Railroad, Denver, Col., was recently incorporated with a capitalization of 50,000 shares no par value. The incorporators, Clare N. Stannard, John E. Loiseau, Harry T. Hughes, and others are officials of the Public Service Company of Colorado, which recently acquired the Grand River Railroad. The Grand River Valley line operates between Grand Junction and Fruita, Col. One of the officials of the road said that the acquisition was a step in its policy of expansion.

"L" Cars Wrecked in Celebration of Grid Triumph

The interiors of two Market Street elevated cars of the Philadelphia Rapid Transit Company, Philadelphia, Pa., were wrecked on Nov. 11 by West Philadelphia High School students, who were celebrating their football victory over the Central High School. At the end of the bachelors' party 28 students went to jail, after fighting trainmen and police who were summoned for the emergency. The windows of the cars were smashed by seats which were hurled through the glass, the electric lights were broken and the cars were in absolute darkness. Advertising cards in the upper side of the cars were torn from their fastenings and thrown through the broken windows. Later it was decided that fellow students in a tribunal would fix the penalty for the rowdism.

Strike in Danbury

Railway and bus employees of the Danbury Power & Transportation Company, Danbury, Conn., which operates electric railway lines in Danbury and bus lines between Danbury and Bethel, went on a strike on Nov. 23. At the present time 59 operators are out. Service is being rendered by independent bus lines and taxi companies have been allowed a temporary certificate to supply service between Bethel and Danbury.

Two reasons are advanced as causes of the strike. It is said the new management refused to recognize the union and enter into an agreement similar to the one in force when the road was run under the name of the Danbury & Bethel Street Railway. The other reason is said to be the plan of the railway to substitute buses on many of its lines in the city of Danbury.

The Danbury Power & Transportation Company has long had under consideration the substitution of buses on most of its trolley lines. Since the strike began officials of the company have petitioned the Public Utilities Commission for authority to discontinue wholly or in part trolley service on ten of its routes and to substitute buses. A hearing has been scheduled for Dec. 3 at the Danbury City Hall and conference between officials of the company and a committee of strikers is planned.

\$5,000 in Prizes Offered by Foshay

W. B. Foshay Company, Foshay Building, Minneapolis, Minn., public utility operator, announces an advertising contest in which prizes aggregating \$5,000 will be awarded for the best series of newspaper advertisements, folder, booklet, single advertisement, slogan, or other form of advertising that may be submitted covering the Foshay utility and investment business. The contest opens Nov. 1, 1926, and closes April 30, 1927. The prizes will be awarded June 1, 1927. The contest rules follow:

1. Every ad should carry the Foshay border and the Foshay signature, as well as the Foshay slogan, "All Your Money—All the Time—on Time."
2. All copy must be centered on one dominant thought which covers our business of financing, controlling and managing public utilities and industrials and the distribution of securities.
3. All advertisements, books or folders must be original.
4. The advertisements may be illustrated or not, according to the taste of the contestant.
5. The advertisements should be submitted in a way that will protect them from damage. We will not be responsible for manuscripts lost in the mails.
6. Send all advertisements to contest editor, W. B. Foshay Company, Foshay Building, 826 Second Avenue, South, Minneapolis, Minn.
7. Contestants are not limited to any number of entries.
8. All contestants must have their entries reach us not later than April 30, 1927.
9. This contest is open to all. The prize winners will be announced June 1, 1927, and the names of winning contestants will be published in your local papers and in our two magazines, the *Foshay Spot Light* and *Net Yields*.

A number of years ago the Foshay doorstep was one office in the First National-Soo Line Building, Minneapolis. The company began by originating and selling its own public utility securities. The organization consisted of Mr. Foshay and one clerk. In 1919, Foshay securities paid \$1,312 in dividends; in 1924, holders of Foshay securities received in dividends, interest and maturities \$269,734. In 1925 the figures were \$443,753. In 1919 the company employed five people and in 1925, 150.

The W. B. Foshay Company controls the Peoples Light & Power Corporation for the purpose of acquiring and operating public utility properties. Through its control of this corporation and other companies, the Foshay company manages utility properties in 107 cities and towns in eight states. These properties supply electricity, gas, water and street railway service to a population in excess of 170,000 people.

Kansas City Would Continue Present Fare

Application for an indefinite continuance of the present electric railway fares in Kansas City, Mo., has just been filed with the Public Service Commission by Bennett Clark, attorney for the Kansas City Public Service Company. Hearings on the application have not yet been set. In previous applications of this nature the commission has granted continuances of six months. In return for a twelve-year franchise extension recently granted, the company agreed to a slight reduction in fares, fixed in the measure at fifteen tickets for \$1, making the fare 6½ cents.

Buffalo Ordinance Would Prohibit One-Man Operation

Corporation Counsel Frederick C. Rupp of Buffalo, N. Y., has prepared an ordinance prohibiting the operation of one-man cars by the International Railway on important streets. It is expected the City Council will approve the new ordinance. The ordinance designates and defines congested thoroughfares and if enacted would prohibit the operation of one-man cars on almost every local line in the city of Buffalo. All but four routes in Buffalo now have one-man cars and these include all of the important lines in the city.

Fare Increase Awaited in St. Louis

An early decision by the Missouri Public Service Commission on the application of Receiver Rolla Wells of the United Railways, St. Louis, Mo., for an immediate increase in the fares of adult passengers is anticipated. The company now receives 7 cents and has asked an 8-cent base fare or two tokens for 15 cents. The ten days allowed by the commission for both the city and counsel for Receiver Wells to file briefs expired on Nov. 27. Evidence produced at the hearings on Nov. 16 and 17 showed that the system was losing \$116,000 monthly under the present fares. Company officials showed that for the year ended Aug. 31, 1926, the railway earned only a 5.2 per cent return on the 1919 valuation of \$51,000,000, without considering about \$5,000,000 in improvements and betterments added since that time.

Safe Drivers' Club Organized at Joliet

In the interest of promoting safety on the streets and highways a Safe Drivers' Club has been organized at Joliet, Ill., under the auspices of the Chicago & Joliet Electric Railway. The club is an honorary organization composed of automobile, truck and bus drivers who take the pledge of the club to drive safely. There are no dues and the only requirement for maintaining membership is to fulfill the pledge. Membership cards have already been issued to about 500 drivers, 100 of whom are employees of the Chicago & Joliet Electric Railway.

Detroit May Vote on Rapid Transit Routes in March

Reports from Detroit indicate that at the March election voters may be asked to approve or disapprove the rapid transit routes recommended by the Municipal Rapid Transit Commission last August. It will be remembered that on Aug. 16 the commission suggested for approval an initial system of rapid transit involving 46.6 miles of line, of which 42 miles would be in the city of Detroit. The total cost of construction was estimated at \$187,798,000, of which \$172,011,000 would be required for the sections within the city of Detroit.

Briefly, the proposed system is divisible into four lines, namely: Vernon Highway, crosstown line, 11.2 miles; Woodward-Fort, north and south line, 7.5 miles; Salina-McGraw-Grand Boulevard-Harper-St. Jean, crosstown line, 14.3 miles; Grand River-Jefferson-Mount Elliott-Gratiot, west side and east side line, 13.6 miles.

In its report of Aug. 16 the commission recommended to the Common Council that it should take the steps necessary to submit this plan of routes to the electors at the next general election to be held on Nov. 2, 1926, but action of this kind was not taken by the Council. Now it is being suggested in Detroit that the routes be submitted to the electors at the coming March election.

News Notes

Rerouting in Effect in Baltimore.—The United Railways & Electric Company, Baltimore, put into effect on Dec. 1 rerouting on nine of its lines in the city. The action was taken as a result of the recommendation made several months ago by Kelker, DeLeuw & Company, Chicago, who made a traffic survey of the city.

Freight Business Gains.—Since the completion of its re-electrification program last August and the placing in service of four new freight locomotives freight business on the Chicago, South Shore & South Bend Railroad, Michigan City, Ind., has gained enormously in volume. Revenue from the transportation of freight in the month of September of this year was approximately \$1,600 in excess of that earned in September, 1925, while October revenue was more than \$2,500 greater than earnings during the corresponding month of last year. A large percentage of this increase is attributed to the growth in shipments of less than car-load lots, which business the road is seeking to develop by offering fast, overnight deliveries to any point on the line.

Followers of Neutral Zone Increase.—The St. Louis Safety Council and the Associated Retailers of St. Louis have joined Director of Streets and Sewers Brooks in his efforts to have a neutral zone for street cars when Olive Street is widened from 60 to 100 ft. between Twelfth Boulevard and Channing Avenue. Both organizations contend that the neutral zone will make Olive Street safe for pedestrians and street car patrons and also speed up the car service for the thousands who depend on the cars for transportation. It is estimated that 95 per cent of the users of Olive Street ride on street cars.

Court Fixes Grade Condemnation Rights.—County Judge Wilbur A. Trares at Edwardsville, Ill., on Nov. 17, ruled that the Illinois Division of Highways had the right, in the public interest, to condemn property needed to build an overhead bridge for Illinois Highway No. 4. The Illinois Commerce Commission four years ago ordered the Division of Highways to institute

proceedings to condemn property for the viaduct, but the division's authority to do so was questioned by property owners affected. The plan, if carried out, will eliminate a crossing at grade of the highway and the right-of-way of the Illinois Traction System that has been a cause of great concern from the standpoint of safety.

Trolleys to Be Used by Officials.—The Minnesota Department of Administration and Finance has instructed all other departments that state officials and employees must ride electric railway cars in first-class cities instead of hired automobiles. The order follows a long investigation of travel and subsistence allowances. Buses may be utilized only in emergencies. Where automobiles must be hired for lack of other transportation the allowance is 8 cents a mile.

Tacoma Tries P.A.Y.L. System.—The "pay-as-you-leave" system will be tried in Tacoma, Wash., by the Tacoma Railway & Power Company on its Point Defiance line, where outbound passengers will pay their fares as they get off instead of when they board the cars. Passengers on inbound cars will pay upon entering, as usual. If the scheme saves as much time and speeds up service to the extent expected it will be extended to other lines of the company. Mayor M. G. Tennant, in conference with railway officials, approved the plan.

One-Man Cars on Four Lines.—With the installation of eleven one-man cars on the Lamar line of the Memphis Street Railway, Memphis, Tenn., on Nov. 7 the company now has four lines completely equipped with full schedule operating the new type of electric rail coaches. The first line to be equipped was the Peabody line, on which service was started Aug. 11. On Sept. 29 the Second Street-DeSoto Park line was equipped, eight cars being put into service, and on Oct. 26 the Forrest Hill line was equipped, seven cars being put into service. This makes a total of 37 cars, including the Lamar service of the new type now in operation.

Lower Fare in Effect.—The Portsmouth Public Service Company has put into effect a reduced fare on its interurban operated from Portsmouth, Ohio, to Ironton, Ohio. The new fare is 50 cents one way and \$1 round trip. The old fare was 75 cents one way and \$1.50 round trip.

Exceeded Speed Limit, So Arrested.—Three motormen on the East Ferry line of the International Railway, Buffalo, are under arrest on charges of operating their cars in excess of 15 m.p.h. over a section of track which the city says is in a dangerous condition. The men entered pleas of not guilty when arraigned in City Court. The city is making a test case to determine the validity of the ordinance, enacted after the International Railway did not comply with a ruling of the Public Service Commission of New York State to repair its tracks in certain streets because of their alleged dangerous condition. The new city ordinance prohibits the operation of local cars in excess of 25 m.p.h., except on certain specified streets where the speed has been fixed at 15 m.p.h.

Would Put New Schedule Into Effect.—The Virginia Electric & Power Company has filed a petition with the State Corporation Commission for authority to put into effect the new fare schedule for Norfolk, Va., eliminating all zones in accordance with the unified transportation plan approved by the City Council in October. The city has already approved the new bus fare, over which it has control, and specified the company should apply to the Corporation Commission for a uniform increase on street cars.

Modified Loop Plan Will Be Tried.—The loop plan for operation of the Seattle Municipal Street Railway, Seattle, Wash., offered as an economy measure by Clark R. Jackson, superintendent of public utilities, has been rejected by Mayor Bertha K. Landes on the ground that it might cause serious traffic congestion. However, the Mayor announces that a modified form will be given a trial beginning Jan. 1. The loop plan called for turning back all cars at Pike Street. This change in operation provides for a saving of \$500,000 a year, Mr. Jackson estimates. Some of the recommendations in the Jackson plan, such as curtailment of shuttle service and shortening of runs, have been put into effect.

Foreign News

Express Railway Opened in Germany.—Between the cities of Dusseldorf and Duisburg, Germany, the municipal authorities have completed and opened to traffic an electric railway express line, 17 miles long. The maximum car speed is estimated to be about 19 m.p.h. on private right-of-way between the cities, although the track is on city street in the two towns.

Japan Extends Tramway Lines.—One of the larger cities in Japan is adding 35 miles of line to its existing electric railway system. The cost of this construction will be about 28,000,000 yen (\$14,000,000).

Trolley Buses to Supersede Tramways.—St. Helens Town Council in England has decided to apply to the Ministry of Transport for an order to authorize the working of trackless trolley buses over a number of routes. It is estimated that in this way the expenditure necessary for reconstruction of tramway tracks, amounting to £182,000, will be avoided.

England's Horse Car Banished.—What is said to be the last horse car in England has been withdrawn from service. For some time Morecambe, a Lancashire seaside resort, has been using this old-fashioned system of transportation, but on Oct. 4 the town authorities decided to adopt a more modern method and established bus service. However, the old horse cars were not scrapped, nor did they revert to the junk dealer; instead, the municipal tramways committee auctioned them off to people who have painted them up and converted them into greenhouses and garden shelters.

Recent Bus Developments

Chicago Surface Lines Ordered to Add Feeder Bus Service

Delayed for many months by a variety of intervening and protesting petitions, one of which had been filed by the Chicago Motor Coach Company, permission to operate bus service on the northwest side of the city of Chicago has finally been granted by the Illinois Commerce Commission to the Chicago Surface Lines.

The Chicago City Railways, which operates the north and west side surface lines, had asked permission to operate a bus route on Diversey Boulevard between the terminus of its rail lines, at Crawford Avenue and Laramie Avenue. The petition was indorsed by residents of the districts affected.

The rate of fare and the exchange of transfers now prevailing on the surface lines were ordered by the commission to prevail on the new bus route. This will permit a ride to the downtown district for a 7-cent fare by means of transfer. Under present conditions, residents of outlying districts which will be served by the new bus route would pay a 10-cent fare to private bus lines in addition to the 7-cent street car fare.

If the order, issued on Nov. 18, is carried out, this will be the first time any of the surface lines of Chicago has provided motor transportation. In issuing the order, P. H. Moynihan, chairman of the commission, indicated that similar petitions would be granted to the surface lines where transportation was needed, but where the expense of laying permanent tracks would not be justified in view of the sparse population. The city of Chicago is now endeavoring to obtain extension of the surface lines on Milwaukee, Elston and Vincennes Avenue through supplementary bus lines.

Bus Survey in Philadelphia

The Pennsylvania Public Service Commission on Dec. 1 ordered a survey of the bus-loading problem in Philadelphia. Increased congestion due to the extended use of passenger buses caused the move. The survey will be undertaken by the commission's bureau of engineers.

Seeks Lower Fare.—Application has been filed with the Ohio Public Utilities Commission for a new schedule on the Wheelersburg bus line, operated by the Portsmouth Public Service Company, Portsmouth, Ohio. The schedule provides a fare reduction, effective Nov. 25, from 25 cents to 20 cents, if passengers take advantage of the \$3 book of tickets. Cash fare on the Wheelersburg bus line will remain at the old schedule.

Opposes Independent's Extension.—The International Railway, Buffalo, N. Y., appeared before the New York State Public Service Commission at a recent hearing in Buffalo in opposition

to the application of Leon W. Paxton and Charles McClure, operating as the Akron & Lockport Bus Company, for permission to extend the line so as to give service between Akron and Lafayette Square, Buffalo.

Buses for Charter in Washington.—Residents of Washington, D. C., are being reminded by the Capital Traction Company that "if you are planning an excursion about town, in the suburban communities, to points in Virginia or Maryland, to a football game, a wedding, a dance or whatnot, keep in mind that the Capital Traction Company has a few modern motor coaches and buses for hire for such purposes!"

Winter Excursion Rate Announced.—The Philadelphia Rapid Transit Company, Philadelphia, Pa., announces an intercity motorbus service to New York at the winter excursion rate of \$4.75 for the round trip.

New Service on Trial.—Bus service will be established by the Milwaukee Electric Railway & Light Company between Racine and Mygatt's Corners on a two months trial basis. A 10-cent fare with a transfer to Racine city cars will be charged. More than 115 families signed a petition signifying their intention of supporting the new line.

Seeks to Abandon Route.—Authority to abandon the bus route operated by the Indiana Public Service Corporation between Fort Wayne, Ind., and Peru, Ind., is asked in a petition filed with the Indiana Public Service Commission. The line is to continue between Fort Wayne and Huntington. Losses of from 10 to 15 cents a mile are cited as a reason for the discontinuance.

Bus Service Extended in Vancouver.—Electric railway service to the car-house district at Vancouver, Wash., ceased at midnight on Nov. 8 and bus service was started the next day. This is the latest line of the Portland Electric Power Company in Vancouver to be discontinued. It had been run eighteen years. The Vancouver lines have been operated at a loss for the last three years.

Must Help Pay for Wear and Tear.—Revocation of consent to operate the Bailey Avenue bus line by the International Bus Corporation, a subsidiary of the International Railway, Buffalo, unless the company agrees to one cent per revenue bus mile to the city to help pay for wear and tear on the pavements has been voted by the Buffalo City Council. The Delaware and Delavan Avenue bus lines are not affected because these franchises are for a fixed term and are not revocable.

Seeks Permission for Bus Route.—The Los Angeles Railway Corporation, Los Angeles, Cal., has applied to the Railroad Commission for permission to operate buses along Mines Avenue and Whittier Boulevard from the intersection of Maple Avenue and East Seventh Street to Beldon Avenue. A hearing will be conducted at an early date.

Financial and Corporate

Operating Ratio Reduced

Net Income of Lines in New York State
Best in Three Years—Commission
Statement Reviewed

Compared with the 1923 returns, the 1924 operating revenues of the electric railways under the jurisdiction of the Public Service Commission, with authority in New York State outside of New York City, show a slight decrease. This is more than offset by lower operating costs, so that the operating ratio has decreased from 83.88 per cent for the former year to 81.50 per cent for the latter year. While increases are observed in the number of passengers carried and in the number of revenue car-miles, they are in each instance less than 1 per cent over 1923 figures.

As in the preceding six years the revenues of this group of utilities have been insufficient to meet operating expenses and fixed charges, although for 1924 the net loss was approximately one-half that for 1922. The commission ascribes this seeming improvement in part to the discontinuance of various unprofitable lines and not wholly to increased efficiency in operation or increased traffic. It says that the complete absence of strikes during the year 1924 is unquestionably a factor in developing this more favorable showing.

On Dec. 31, 1924, only 1,934 miles of road was reported as available for operation as compared with 1,990 and 1,971 at the close of the years 1922 and 1923 respectively. Significant decreases are due to complete discontinuance of operations by the Glen Cove Railroad, Northport Traction Company, Port Jervis Traction Company and Wallkill Transit Company, which companies

represent a total of 21.51 miles, in addition to which the Elmira Water, Light & Railroad Company abandoned 16.21 miles and Peekskill Lighting & Railroad Company 2.90 miles. Advice has been received that subsequent to Dec. 31, 1924, operations were not resumed by the Nassau County Railway and Rochester & Manitou Railroad, which prior to that date had reported 1.50 miles and 7.25 miles of first track respectively, thereby reducing the total mileage at the beginning of 1925 to only 1,926 miles. This figure includes various short lengths of track not definitely abandoned, but over which operations have been temporarily discontinued.

In this connection the commission says there have been a number of abandonments consented to by the commission upon hearings which have indicated that such lines are no longer necessary in rendering service required by the public. These include the Oakwood Avenue line in Troy, the Arbor Hill and Country Club lines in Albany, the Seymour and North Street lines in Auburn, the belt line and Geyser line in Saratoga Springs, a large portion of the Kingston Consolidated Railway in Kingston, that portion of the Chautauqua Traction Company's line from the south line of the village of Westfield to the village of Mayville, that portion of the Hudson Valley Railroad extending from Mechanicsville to Ballston Spa and the Kaydeross Park line of the same railroad extending from Saratoga Springs to Saratoga Lake. Service has been discontinued on the Auburn Avenue and James Street stub lines in Utica. In certain of the foregoing abandonments and cessations,

bus line operation has superseded the abandoned trolley lines. This is true of the Troy, Albany and Utica cases. Bus service has been proposed in Kingston as a partial substitution, but up to the present has not been provided on account of the failure of the city to give the necessary consent.

At the time the report was made receivers were operating, among others, the Hornell Traction Company, Ithaca Traction, Hamburg Railway, Ogdensburg Street Railway, Westchester Electric Railway and Westchester Street Railroad.

Record Travel on Chicago Surface Lines in October

More passengers were handled by the Chicago Surface Lines, Chicago, Ill., in October of this year than in any previous month in the history of the system. Total rides for the month were 135,878,579, against 132,515,318 in October last year. The previous high monthly record was that of December, 1925, when 132,949,516 passengers were handled. The October figures of this year exceeded this figure by 2,929,063.

	1926	1925
January.....	129,604,602	127,666,571
February.....	121,282,868	115,830,619
March.....	131,839,632	128,009,030
April.....	131,452,899	126,052,447
May.....	132,939,381	127,542,240
June.....	132,980,301	125,684,909
July.....	130,235,208	124,566,209
August.....	129,214,055	125,002,113
September.....	127,149,619	122,964,778
October.....	135,878,579	132,515,318
November.....	.....	126,788,880
December.....	.....	132,949,516

With the heavy traffic period of December still ahead of the company, officials anticipate the record may again be broken. In December last year the company put into use 99.8 per cent of all equipment, or all but seven cars, to handle the Christmas shoppers. One hundred new cars have recently been added to the service, representing an investment of \$1,600,000. The maintenance schedule has been arranged in such a way as to provide for the use of practically all cars during the Christmas shopping season, in anticipation of a record traffic.

A more accurate picture of the heavy amount of traffic handled over this year and the corresponding months of last year is seen in the accompanying tabulation.

The divisible receipts for October amounted to \$716,112 after expenses, taxes, renewals and return on purchase price, against \$320,543 in September and \$477,959 in October last year. Brief mention of the record for October was made in the ELECTRIC RAILWAY JOURNAL, issue of Nov. 27, page 983.

Despite the record handling of traffic in October, operating expenses in that month were lower than in the previous month and in October last year, when traffic was not so heavy. This reflects the extent to which operating economies have been put into effect. Operating expenses for October this year amounted to \$3,852,558, or \$37,465 under those of the previous month. In October last year this item totaled \$3,962,650.

RESULTS OF OPERATION OF ELECTRIC RAILWAYS IN NEW YORK STATE, OUTSIDE OF NEW YORK CITY

Item	1922	1923	1924
Number of corporations reporting.....	67	69	*69
Railway operating revenues.....	\$41,858,280	\$42,530,753	\$42,260,468
Railway operating expenses.....	36,978,228	35,674,050	34,661,568
Net revenue railway operations.....	\$4,880,052	\$6,856,704	\$7,598,900
Railway tax accruals.....	2,872,018	2,938,251	2,967,936
Railway operating income.....	\$2,008,034	\$3,918,453	\$4,630,964
Net revenue, other operations.....	1,302,688	1,101,937	1,233,072
Non-operating income.....	924,942	854,561	914,487
Gross income.....	\$4,235,664	\$5,874,961	\$6,778,521
Interest charges.....	9,034,475	8,620,343	8,762,442
Other deductions from gross income.....	694,362	623,402	707,350
Net income, loss.....	\$5,493,173	\$3,368,784	\$2,691,268
Dividends during year.....	1,770,977	1,213,458	658,171
Passengers carried (fares and transfers).....	599,080,364	616,377,402	621,751,146
Revenue car-miles.....	92,481,319	92,135,786	92,644,937
Mileage in New York state.....	1,990	1,971	1,934
Operating ratio, per cent.....	88.34	83.88	81.50

*Of which four companies discontinued operations during the year and two companies did not resume operations subsequent to the close of the year.

STATEMENT OF FARES CHARGED IN CITIES IN NEW YORK STATE, OUTSIDE OF NEW YORK CITY

Item	1921		1922		1923		1924		1925	
	Cities	Per Cent of Total	Cities	Per Cent of Total	Cities	Per Cent of Total	Cities	Per Cent of Total	Cities	Per Cent of Total
5 cents.....	16	26	13	26	13	23	13	23	13	24
6 cents.....	9	8	5	8	7	3	3	3	2	4
7 cents.....	16	24	24	43	27	47	24	43	21	40
8 cents.....	16	13	23	23	13	23	15	27	15	28
10 cents.....	.....	.....	.....	.....	.....	.....	.....	.....	2	4
Total.....	57	100	57	100	57	100	56	100	53	100

COMPARATIVE STATEMENT OF THE OPERATING RESULTS OF THE LONDON UNDERGROUND GROUP YEAR 1925, COMPARED WITH 1924

	Total Railways		London General Omnibus Company Limited		Total	
	1925 £	Increase £	1925 £	Increase £	1925 £	Increase £
Traffic receipts, etc., after the operation of the common fund under the terms of the London Electric Railway Companies' facilities act agreement, dated Dec. 21, 1915, and supplemental agreement, dated Dec. 8, 1921.....	4,599,617	227,981	8,644,035	245,470	13,243,652	473,451
Expenditure.....	2,839,782	73,414	8,248,473	195,158	11,088,255	268,572
Net receipts.....	1,759,835	154,567	395,562	50,312	2,155,397	204,879
Miscellaneous receipts (net).....	504,252	19,406	329,892	14,686	834,144	34,092
Net income.....	2,264,087	173,973	725,454	64,998	2,989,541	238,971
Interest, rentals and other fixed charges.....	1,106,221	155,377	214,324	8,799	1,320,545	164,176
Balance.....	1,157,866	18,596	511,130	56,199	1,668,996	74,795
Appropriation to reserve for contingencies and renewals.....	155,000	.....	300,000	50,000	455,000	50,000
Balance.....	1,002,866	18,596	211,130	6,199	1,213,996	24,795
Dividends on guaranteed and preference stocks.....	389,477	.....	.....	.....	389,477	.....
Balance.....	613,389	18,596	211,130	6,199	824,519	24,795
Adj balance from last year's accounts.....	248,387	70,705	60,502	4,188	308,889	74,888
Total amount available for dividends on ordinary stock and shares and for other purposes.....	861,776	89,301	271,632	2,061	1,133,408	100,683
Dividends on ordinary stocks and shares.....	604,103	61,440	204,131	4,938	808,234	66,378
Rate per cent per annum.....	3.54	.36	.....	.....	4.09	.34
			(Free of Tax)			
Balance carried forward to next year's accounts.....	257,673	9,286	67,501	6,999	325,174	16,285

The income account of the Chicago Surface Lines for October this year compares with October last year as follows:

	1926	1925
Gross.....	\$5,298,430	\$5,145,171
Expenses.....	3,852,559	3,662,650
Residue receipts.....	1,445,871	1,182,521
Joint account expense.....	35,280	10,000
5 per cent interest.....	694,479	694,562
Divisible receipts.....	716,111	477,958
City's 55 per cent.....	393,860	262,877
Company's 45 per cent.....	322,250	215,081

Receiver Reports on Disposition of Kansas City Bond Funds

John T. Harding, special master commissioner under the receivership of the Kansas City Railways, Kansas City, Mo., on Oct. 29 filed his report of the final distribution of the funds derived from the sale of the first mortgage bonds of the company.

On Oct. 4, says the report, \$1,250,000 was remitted to Powell C. Groner, vice-president and general counsel of the Kansas City Public Service Company, purchaser of the railway. On Oct. 26 a further payment of \$1,841,815 was made to Mr. Groner.

An additional \$1,500,000 to complete the total of \$4,591,815 will be paid him later, but at the time of filing delivery

was being awaited of the bonds in this amount to Mr. Harding.

The few bondholders who did not participate in the reorganization plans of the old company will be reimbursed to the extent of \$195,844, now on deposit for that purpose.

Details of London Underground Operation for 1925

The gross traffic receipts of the so-called Underground Group, London, England, which comprises the Metropolitan District Railway, the London Electric Railway, the City & South London Railway, the Central London Railway and the London General Omnibus Company, Ltd., for 1925 amount to £13,243,652, an increase of £473,451. The aggregate operating expenses are £11,088,255, and these are increased by £268,572 over the previous year. As a result the net receipts of the group in 1925 were £204,879 more than they were the year previous.

In order to carry the traffic 209,379,914 miles was worked, an increase of 13,433,300 over the preceding year. Of these miles 143,943,201 was worked by the omnibuses, an increase of 6,892,666 over the previous year. The remaining 65,436,713 was worked by the cars of

the railways. These and other operating data about the group are contained in the accompanying tables.

Arbiter Named in Settlement of Depreciation Fund

The Transit Commission recently appointed Reuben L. Haskell of Brooklyn, N. Y., as its arbitrator of contributions to be made to the depreciation fund of the New York Rapid Transit Corporation, a Brooklyn - Manhattan Transit subsidiary, under its contract with the city. Mr. Haskell, until Jan. 1 last, was County Judge of Kings County. For five years prior to that he was Representative in Congress from the Tenth District, and before that was Assistant Commissioner of Public Works in Brooklyn and Borough Secretary.

At present the New York Rapid Transit Corporation, which operates the Brooklyn-Manhattan Transit elevated and subway lines, is making annual contributions of \$400,000 into its depreciation fund for replacements of the railroad and equipment. It already has paid in about \$2,500,000 to this fund but the Transit Commission's accountants have recommended that the annual contribution be increased to \$800,000.

MISCELLANEOUS STATISTICS OF LONDON UNDERGROUND GROUP FOR YEAR 1925, COMPARED WITH 1923

	Total Railways		London General Omnibus Company Limited		Total	
	1925	Increase	1925	Increase	1925	Increase
Passengers carried:—						
Ordinary.....	217,914,496	12,033,369	1,236,547,753	78,136,276	1,454,462,249	90,169,745
Workmen.....	51,416,986	5,937,680	.....	.....	51,416,986	5,937,680
Seasons.....	49,370,358	2,374,708	.....	.....	49,370,358	2,374,708
Total.....	318,701,840	20,345,757	1,236,547,753	78,136,376	1,555,249,593	98,482,133
Average daily number of passengers carried.....	942,905	56,165	3,658,425	148,087	4,601,330	204,252
Route-miles owned or leased.....	M. Ch.	M. Ch.	M. Ch.	M. Ch.	M. Ch.	M. Ch.
Route-miles run over by companies' trains.....	71 64	.....	.....	.....	71 64	.....
Road-miles run over by company's omnibuses.....	139 59.5	.....	801 0	23 0	139 59.5	23
Number of stations.....	118	2	43	3	118	2
Number of garages.....	.....	.....	.....	.....	43	3
Number of lifts.....	185	7	.....	.....	185	7
Number of escalators.....	40	8	.....	.....	40	.....
Number of car-miles run in relation to passenger receipts.....	65,436,713	6,540,634	143,943,201	6,892,666	209,379,914	13,433,300
Number of car-miles run by companies' trains or omnibuses.....	76,909,417	6,412,561	143,943,201	6,892,666	220,852,618	13,305,227
Number of cars or omnibuses owned.....	1,588	27	4,136	21	5,724	41

† Includes 7m. 30ch. run over the City & South London Railway (Euston to Clapham Common).

‡ Includes 11m. 5ch. run over the London Electric Railway (Euston to Edgware and Highbury).

§ The number of omnibuses owned and/or worked by or in conjunction with the London General Omnibus Company, Ltd., is 4,704.

Italics denote decrease.

The New York Rapid Transit Corporation has asked that this proposed increase be submitted to arbitration, and under the contract the commission and the railroad each selects an arbitrator and these two select a third.

Bids Announced on Dayton, Covington & Piqua Equipment

Petitions of approval for the sale of part of the property of the Dayton, Covington & Piqua Traction Line have been filed in the federal district court at Dayton, Ohio, by Charles Eliff, receiver for the company. The company stopped operations on Nov. 6.

It is estimated that the total junking price of the line will be at least \$115,000, which is \$12,000 greater than the highest bid for the property as a going concern. Acceptance of the bid of Jacob Ziskind, Lowell, Mass., for the tracks, trolleys and other smaller equipment was recommended. Mr. Ziskind made a bid of \$81,500. Bids of the Ohio Bell Telephone Company for certain poles amounting to \$1,694, and of the Buckeye Light & Power Company for other poles amounting to \$480 were recommended to the court for approval. Real estate of the company which has not been sold will bring the price up to at least \$115,000, it is said. A bid of \$130,000 was made by R. C. Coleman, Springfield, Ohio, who sought the line to aid him in getting the bus permit. This bid was rejected.

Melbourne Shows Gain with Higher Fares

Receipts from passengers increased during the year ended June 30, 1926, on the street railway system of the Melbourne & Metropolitan Tramways Board, in Australia. Total receipts from passenger fares during the year were £2,142,234, a gain of £186,794 over the previous year. Part of this gain came from higher fares, as on May 1, 1926, the fares were raised on an average of about 15 per cent. The minimum adult fare on both cable and electric tramways is now 2d., a number of reduced rate return fares was abolished or the amount of the reduction was made less, and fare zones were shortened. The increased revenue received since the alteration in the fare rate indicates a revenue increase of about £280,000 per annum, but recent increases in wages will add about £60,000 per annum to operating expenses.

During the year there were two "go slow" strikes over part of the systems. One, which was on the Essendon Tramway, lasted a month, when it was abandoned by the men. The other involved only the employees of one depot and was referred to the Court of Concilia-

tion and Arbitration, whose decision has not yet been given.

During the year 14.18 miles of cable track was converted to electric traction, approximately 8 miles of new electric railway track was built, 50 cars were added to the rolling stock and more cars have been ordered. Six new buses were purchased, making the total number now in service 56. Extensions were made to the repair shop and other improvements were introduced.

Some statistics for the year ended June 30, 1926, are given in the accompanying table.

New York State Railways Report for Quarter

A decline in revenues of the lines of the New York State Railways in Rochester, Syracuse and Utica for the quarter ended Sept. 30 over that of a similar period in 1925 is shown in the report for the three months, filed with the Public Service Commission. The

	1926	1925
Operating revenue.....	\$2,307,448	\$2,265,753
Operating expenses.....	1,819,255	1,670,389
Net operating revenue....	\$488,193	\$593,364
Operating income.....	368,559	442,953
Non-operating income....	86,151	86,763
Gross income.....	\$454,710	\$529,715
Deductions.....	385,407	378,280
Net corporate income....	\$69,303	\$151,436

net corporate income was \$69,303 for the three months of this year, against \$151,436 for the corresponding period in 1925 and \$217,774 in 1924. The report covered a period prior to the granting of higher fares in Utica and Syracuse. The report does not segregate operations as to cities.

The result for the quarter of 1926 are compared with those of the previous year in the accompanying table.

Approval of Track Removal in Philadelphia

Stockholders of the Union Traction Company met on Nov. 29 and voted approval of the removal of the trolley tracks from Chestnut and Walnut Streets to the Chestnut Street subway. That was the final act of the underlying companies of the Philadelphia Rapid Transit Company controlling the tracks in the two streets.

Action taken by the four underlying companies clears the way for the actual start on the long discussed \$20,000,000 surface-car subway from Fifth Street and Delaware River Bridge, under Chestnut Street to West Philadelphia.

More than a majority of the stock of the old Union Traction Company was represented at the meeting. A. Balfour

Brehman, vice-president, offered the resolution, which was seconded by Timothy M. Cleary, secretary.

Defaults Decrease \$234,615,700 in Four Years

In the year ended Nov. 1, 1926, \$20,613,300 public utility bonds were eliminated from the default list through foreclosure, sale or payment, while in that time there was \$9,586,000 in new defaults making a total of \$129,098,400 still in default. The reduction in the year was \$11,027,300. As Dow, Jones & Company, New York, who compile this list each year, see it, the list of defaulted bonds is likely to be materially reduced during the current year, particularly in view of the improved position of the electric railways.

The progress in decreasing defaults has been continuous since 1922, when the total reached \$363,714,100. By contrast with this year's figure the decrease is \$234,615,700.

The list of defaulted utility bonds is made up chiefly of traction issues.

New Director Elected.—C. Bruce Maiden has recently been elected a director of the Key System Transit Company, Oakland, Cal.

Earnings Hold Up Well.—Operating revenue of the Springfield Street Railway, Springfield, Mass., for the first nine months of 1926 was \$2,358,941, or \$55,599 less than for the corresponding period of 1925. Net income for 1926 showed a reduction of \$53,468 in comparison with the similar nine months' period in 1925. Car-miles traveled showed a reduction of 13,812. Clark V. Wood, president, said that the net earnings of the company, exclusive of depreciation charges, were more than 2.9 times the bond interest requirements.

Would Offer Bonds.—Application for authority to sell \$40,000 in 5 per cent first mortgage bonds at not less than 86 per cent of par has been made to the Ohio Public Utilities Commission by the Columbus Interurban Terminal Company. The application was filed by Arthur B. Bland, president, and F. A. Healy, secretary. The purpose is to purchase trackage and add to the facilities of the company's freight terminal in Columbus, Ohio. The Columbus Interurban Terminal Company owns the terminal passenger and freight station in Columbus. It is operated for the convenience of three interurban railways by which it is owned.

Deficit for Four Months Period.—For the four months period ended Oct. 31, 1926, the total revenue from all sources of the Interborough Rapid Transit Company, New York, N. Y., was \$18,853,988, a decrease of \$656,167 over the corresponding period of last year. Expenditures for operating and maintaining the property increased \$589,670. Taxes payable to the city, state and the United States increased \$107,300. Rentals and other income deductions increased \$30,778. The net result for the four months was a deficit of \$1,749,834. This is \$1,383,916 greater than the deficit for the corresponding period of last year. The comparison with last

RAILWAY STATISTICS MELBOURNE & METROPOLITAN TRAMWAYS, AUSTRALIA

	Cable	Electric	Buses
Revenue from railway operation....	£1,048,414	£1,007,210	£97,304
Operating expenses.....	£847,102	£816,178	£112,289
Vehicle-miles.....	12,393,911	10,657,728	1,449,710
Passengers carried.....	127,882,115	99,017,938	7,164,095
Average passenger receipts			
Per vehicle-mile.....	20.167d.	22.599d.	16.095d.
Per mile of single track.....	£13,496	£5,948	£2,472
Per passenger.....	1.954d.	2.431d.	3.257d.
Number of passengers per vehicle-mile....	10.318	9.29	4.95

year is influenced by the strike during the month of July of this year, as well as the fact that in July of last year there was a lump sum payment of \$770,000 on account of the new advertising contract, against which there was no similar payment this year.

November—A Good Month in Seattle.—Street railway revenue on the lines of the Seattle Municipal Railway, Seattle, Wash., has averaged \$80 a day more during November than it did on corresponding days of 1925, according to D. W. Henderson, superintendent. The receipts for every other month of the year have been less than those of the corresponding months of last year, with the biggest loss in February, when the fares averaged \$839 a day less than in February, 1925.

Net Corporate Income Lower.—For the four months ended Oct. 31, 1926, the passenger revenue of the Brooklyn City Railroad, Brooklyn, N. Y., was \$3,734,156, against \$3,748,041 for a similar period of last year. Operating expenses and taxes increased from \$3,212,962, to \$3,231,197 for the four months ending Oct. 31, 1926. After the consideration of income deductions, there was a net corporate income of \$401,492 for the four months period of 1926, against \$446,915 for the four months period ended Oct. 31, 1925.

Authorizes Car Line Sale.—The Public Service Commission has recently granted the joint application of the City & Suburban Railway of Washington and the Washington Railway & Electric Company permitting the sale by the former company of all its state property rights and franchises within Prince Georges County to the Washington Railway & Electric Company. The stock of the suburban has been owned and controlled for some time by the Washington company. The order is just the official turning over of all the physical assets to the parent company.

Revenue Lower in October, 1926.—For October, 1926, the revenue of the Boston Elevated Railway, Boston, Mass., exceeded the cost of service by \$2,723, against \$117,704 for a similar month in 1925. The average fare for revenue passenger was 9.263 cents, against 9.279 cents. The number of revenue passengers carried was 31,423,943, against 31,890,185 for October, 1925. Total miles operated equaled 4,901,082, against 4,699,174 in October, 1925. This included motor bus mileage of 455,376, against 275,511 in October of the year previous.

Taxes for Assessments Announced.—The assessed valuations of all classes of property in St. Louis, Mo., total \$1,292,357,285 for the 1926 taxes, according to an announcement of the State Tax Commission. This is an increase of \$65,188,085 over the 1925 assessments. It is 26.7 per cent of the grand total of \$4,835,000,000 for the entire state. Under the distributable property law of the state the \$47,144,102 assessment of the United Railways, was apportioned at \$38,645,780 to the city and \$8,408,322 to St. Louis County. This assessment does not include land, buildings, supplies and other items assessed locally, but represents only property returned to the State Tax Commission.

Legal Notes

GEORGIA.—*Ordinance Which Requires Jitney Operators to Furnish Liability Bonds to City Is Legal.*

The regulation and control of jitney bus traffic comes clearly within the powers of a municipality. Hence an ordinance requiring the operators of such buses to furnish to the city a bond for the protection of persons injured, is the exercise of ordinary and necessary means of regulating such traffic, and the right of the city to sue on such a bond is a necessary consequence. [Transylvania Casualty Insurance Co. vs. City of Atlanta, 134 Southeast. Rep., 632.]

GEORGIA.—*Passenger Projecting Elbow Out of Window Not Negligent.*

It is not negligent per se for a passenger upon a street car to sit with his arm protruding not more than two or three inches out of the window on the side adjoining the parallel track, even though there may be horizontal bars at the window to suggest to the passenger the danger of this practice. Whether such conduct is negligent in certain circumstances is a question of fact for the jury. [Georgia Railway & Power Co. vs. Ogletree, 134 Southeast. Rep., 830.]

ILLINOIS.—*Value of Land Injured by Transmission Line*

Where a strip of land was condemned for an electric transmission line, the burden of proof of damages to land outside the strip was on the land owner. Such value should be on the basis of the most profitable use for which the land was available at the time, but "availability" refers only to present capacity for use, as may be anticipated with reasonable certainty and made the basis of intelligent estimates. [Illinois P. & L. Co. vs. Parks et al, 153 Northeast. Rep., 483.]

KENTUCKY.—*Passenger Falls After Stepping on Pebble in Street While Alighting.*

A street railway company is not responsible to passengers for injuries resulting from defects or obstructions in the street, except so far as they are in the part of the street which the railway is obliged to keep in repair or where a conductor knows or should know of obstructions or other danger at a point where passengers alight. The company is not liable if a passenger leaving a car steps on a pebble or other small rolling object on a smooth concrete pavement and falls. [Kentucky T & T Co. vs. Soper, 286 Southwest. Rep., 776.]

MASSACHUSETTS.—*Discretion of Trustees in Withholding Dividends Upheld.*

The Eastern Massachusetts Street Railway Company was authorized under a special act of the legislature which directed the governor to appoint five trustees to operate the property for a certain term. After a number of years of such operation a suit in equity was brought against the trustees by certain stockholders to compel the payment of

dividends on the common and adjustment shares and reduce the amount being expended for depreciation and rehabilitation. The court held that expenditures necessary to keep the capital intact are operating expenses and are to be paid before dividends are paid, and that the discretion of the trustees as exercised in this matter could not be said to be unreasonable or in violation of law. [Adams vs. Eastern Massachusetts Street Railway et al, 153 Northeast. Rep., 466.]

NEW JERSEY.—*City Council Has Large Discretion in Regulation of Buses.*

A city council has large discretion in controlling and regulating the business of motor buses operating on public streets for the convenience of the traveling public. An ordinance granting such a bus franchise, accompanied by an elaborate schedule providing for the time that buses must enter and leave the city, is therefore legal. [Dryer vs. City Council of Union City, 134 Atlantic Rep., 624.]

NEW YORK.—*Car Has Right of Way Over Pedestrians Between Street Intersections.*

An automobile driver stopped his car in the middle of a block to make some deliveries and was struck by a trolley car while he was crossing on foot to the left-hand side of the street between two street intersections. He was held to be negligent as a matter of law, as the rights of a person attempting such a crossing are subordinate to the rights of a trolley car. [Neuman vs. Union Railway, 243 New York Supp., 249.]

NEW YORK.—*Action by Public Service Commission Without Its Jurisdiction Is Void.*

The Public Service Commission granted a bus franchise without notice to a parallel electric railway whose service would be affected, as required by law. In such circumstances, the Supreme Court declared the certificate of convenience and necessity granted to the bus line to be null and void. [Hudson Valley Railway vs. United Transportation Co., 217 New York Supp., 614.]

NEW YORK.—*"Fair Value for Rate Making" of a Utility.*

A fair value for rate making of a utility is not necessarily reproduction cost less depreciation, as such a rule in times of price deflation might work a hardship on the utility and in times of price inflation might give the utility more than a reasonable return on its property. A fair value for rate making is one which will enable the utility to realize the expense of operating and keeping up its road and meeting its financial obligations from investments with a reasonable excess for dividends and contingencies. Anything below a fair return is confiscatory and anything above it is exorbitant and oppressive. [City of Rochester vs. New York State Railway, 217 New York Supp., 452.]

NEW YORK—Care Required at Plazas.

A pedestrian crossing a plaza not at a regular street crossing is not a trespasser. Hence, as a matter of law, a motorman is not excused when he suddenly doubles his speed at such places and injures a pedestrian. [Hinz v. Eighth Railroad, 152 Northeast Rep., 475.]

OHIO.—Partial Satisfaction Received from One Responsible Party Does Not Release Other.

A city and a railway were sued successively for injuries by a passenger who stepped from the car into a hole in the street. They were held not to be joint tort-feasors because the city's liability was based on its failure to keep the street in repair and the company's liability came from stopping the car at a dangerous place for passengers to alight without warning them. Hence, partial satisfaction received by judgment from the city did not relieve the company from a later suit. [Pohl vs. Cincinnati T. Co., 151 Northeast Rep., 806.]

OHIO—Contract with Union—Withdrawal from Arbitration.

"Contracts by which an employer agrees to employ only union labor are contrary to public policy when they take in an entire industry of any considerable proportion in a community so that they operate generally in that community to prevent or seriously deter craftsmen from working at their crafts or workmen from obtaining employment under favorable conditions without joining a union. Either party in common law arbitration may withdraw therefrom at any time before the award was actually made. The award of arbitrators made under a contract which is against public policy cannot be enforced. Where there is legal fraud in the selection of the key arbitrator, the award is not binding. [Polk et al. vs. the Cleveland Railway, 151 Northeast Rep., 808.]

PENNSYLVANIA.—Car Trust Securities Held Taxable Under State Law.

A section of a state law provides that "all script, bonds, certificates and evidences of indebtedness issued***or***assumed, or on which interest shall be paid by any and every private corporation***are hereby made taxable for state purposes." Certain car trust certificates were held taxable by the State, although another section of the law indicated that certain other car trusts were not so taxable. [Commonwealth vs. Philadelphia R. T. Co., 134 Atlantic Rep., 455.]

RHODE ISLAND.—Trolley Car Strikes Automobile in Rear

An automobile on the track just ahead of a street car waited at a street intersection for the traffic signal. After the signal had been given, both car and automobile started, but the automobile stopped suddenly to avoid another automobile which looked as if it were about to cross. A rear end collision from the trolley car behind ensued. The court held that the duty of the automobile driver to give timely notice to the vehicle behind and the negligence of the motorman in the circumstances, were questions for the jury. [O'Donnell vs. United Electric Railways, 134 Atlantic Rep., 642.]

Personal Items

New Vice-President of Accounts in Philadelphia

John F. Schmunk, a certified public accountant with offices in Harrisburg, Pa., has been appointed vice-president in charge of accounts of Mitten Management, Inc., operators of the Philadelphia Rapid Transit Company, Philadelphia, Pa. Associated with the bureau of accounts and statistics of the Public Service Commission under Coleman Joyce, the first chief of the bureau, Mr. Schmunk started business in Harrisburg in a partnership with Mr. Joyce, when the latter left the commission. Later Mr. Joyce left to become affiliated with Mitten Management and recently he was made assistant to Thomas E. Mitten, the head of the corporation. Mr. Schmunk was engaged at various times by the company in accounting and recently he assisted in valuing the property owned by the Philadelphia Rapid Transit in the case before the Public Service Commission over an increase in fares.

Charles E. Chalmers, receiver of the Second Avenue Railroad, New York City, N. Y., has been elected president of the National Bank of Yorkville, which opened for business on Dec. 1 at Lexington Avenue and 85th Street. He will continue his duties as receiver of the railway property. The Second Avenue Railroad has been one of the hardest hit in New York. Mr. Chalmers has worked strenuously to improve the property physically and has succeeded to an unusual degree in rehabilitating it, considering the handicap under which he labored. He was one of the first traction managers in New York to recognize the possibilities of the one-man car and he rebuilt practically all the rolling stock of the company for such service. The work carried out by him has been described from time to time in the *ELECTRIC RAILWAY JOURNAL*. It reflects great credit on him for his acumen in authorizing the undertaking and on the staff for carrying the changes through so successfully.

W. R. Morrison returned on Nov. 8 to the operating department of the Illinois Power & Light Corporation as division manager of the Quincy division. Mr. Morrison formerly was in charge of the operation of the Wichita Railroad & Light property for twelve years and later was transferred to the engineering department at Peoria, in which position he had charge of general construction work, including the new plants at Jacksonville and Champaign, Ill.

Obituary

V. R. Powell

Transportation held a peculiar fascination for the late Virgil R. Powell, manager of the Peoples Railway, Dayton, Ohio, brief mention of whose death was made in the *ELECTRIC RAILWAY*

JOURNAL for Nov. 13. He was progressive and anxious that his line should give the best of service. Lately he had come more and more to the conclusion that the progress he desired was impossible until increased fares were authorized. It was his plan to educate the public into an appreciation of the service rendered and of the inability of a corporation to render good service unless it had the money wherewith to go ahead. On this subject he prepared a number of addresses which he delivered before civic organizations.

Years ago it would have surprised no one more than Virgil Powell himself to know that some day he was to be general manager of an electric railway property. At the age of eighteen he was a country school teacher. This calling was followed until he entered the electric railway field, presumably for a time only. The step was taken to provide him with funds to complete his classical education. Once within the railway arena, he saw the problems which the industry offered at that time, but he also saw the possibilities ahead and made up his mind to remain in that service.

During his early years of association as conductor on the Peoples Railway he completed a course in electrical engineering. That was the beginning of constant application to the various positions of timekeeper, office manager in the track and overhead line construction department, storekeeper, inspector, assistant superintendent of transportation, superintendent, claim adjuster in the operating department, and, finally general manager in 1924, replacing W. E. Boileau. In his service at Dayton there was one interruption, however, in April, 1904, when he was transferred to the Chicago & Joliet Electric Railway, another subsidiary of the American Electric Power Company. Here he served as assistant superintendent of transportation. Two years later he returned to Dayton to assume the position of superintendent and claim adjuster of the Peoples Railway, filling the vacancy caused by the death of Michael Kelly, superintendent.

Mr. Powell was born in Mechanicsburg, Ohio, in 1879. He received his education at public schools there and also attended Ohio Northern University at Ada. Mr. Powell was a member of the Dayton Chamber of Commerce and was active in civic, fraternal and social affairs of Dayton.

Col. William G. Dows, president of the Iowa Railway & Light Company, Cedar Rapids, Iowa, died on Nov. 25 in the University of Iowa Hospital at Iowa City. He was one of the best known utility men in the state. Mr. Dows was 62 years old. He retired from active participation in the railway business in 1919, when he was succeeded by his son as general manager of the Iowa Railway & Light Company. In addition to his utility experience he was prominent in financial and political affairs throughout the state.

Manufactures and the Markets

News of and for Manufacturers—Market and Trade Conditions
A Department Open to Railways and Manufacturers
for Discussion of Manufacturing and Sales Matters

Seattle Car Order Still Under Consideration

The proposal to buy 80 new light-weight cars for the Seattle Municipal Railway, Seattle, Wash., has not been abandoned. This fact was disclosed when a conference for the near future was arranged with members of the City Council, Board of Public Works and Mayor Landes to decide whether an effort would be made to carry through the deal. An item of \$1,400,000 was provided in a railway utility bond issue several months ago for the new cars and the Board of Public Works favored an award of the contract to the St. Louis Car Company, but when the company sought certain definite assurances under the terms of the contract the matter was put over indefinitely.

New Equipment in Virginia

The Virginia Electric & Power Company, Richmond, Va., will shortly award a contract for ten 44-passenger street cars of double-truck de luxe type. The company has placed an order for 21 21-passenger buses and has contracted for ten additional 29-passenger buses. The new equipment will cost approximately \$300,000.

Aluminum Car Placed in Operation by Cleveland Railway

The Cleveland Railway's aluminum car, partially completed for the exhibit at the October convention of the American Electric Railway Association, is about to be placed in regular service. The car was assembled in the Harvard shops of the Cleveland Railway. It is the first of its kind to be constructed.

Practically the same design and construction were followed as embodied in the latest steel type used by this company. Aluminum and aluminum alloys were substituted under the direction of engineers of the Aluminum Company of America, with a consequent weight saving of approximately 6 tons.

There are several alloys used in different parts of the truck and body assembly, depending upon the nature of the strength required. These alloys are often known as duralumin. One of the common alloys said to have nearly the same strength as steel contains an admixture of 4.5 per cent copper, 0.75 per cent magnesium and 1 per cent manganese.

The side frames of the trucks were pressed into shape by the J. G. Brill Company with the same equipment used in forging steel side frames. The standard structural shapes used are manufactured by the extension process rather than by the rolling process to which resort is had in manufacturing steel shapes.

Practically all truck parts and equipment, except wheels, axles, motors, gears and electrical equipment, are built of aluminum.

All body parts are aluminum or alloy except doors and glazing. Bucket type seats are used and all seats face forward.

It is expected that the reduction in the weight of the car will effect a saving of 15 per cent in power.

100 New Cars for Massachusetts Cities

Tentative Rehabilitation Plans for Springfield and Worcester Call for Large Expenditures

At a recent meeting of the board of directors of the New York, New Haven & Hartford Railroad tentative plans for the rehabilitation of the Springfield Street Railway, Springfield, Mass., and the Worcester Consolidated Street Railway, Worcester, Mass., were formally approved and Vice-President E. G. Buckland was authorized to draw up agreements co-operatively with the City Council of each city.

The Springfield plan for rehabilitation in its tentative stages provides for the purchase of 50 trolley cars, double tracking in Summer Avenue and Belmont Avenue, a loop through Taylor Street and the substitution of buses on the Worthington Street line. These are parts of the plan to be taken care of first and probably followed by lesser improvements. The new cars to be purchased will be of a lighter type than the present double-truck two-man cars. They will have a 50-passenger capacity and will be arranged so they may be easily operated by one man or two men as desired. The estimated cost of the 50 cars is placed at \$700,000.

The plans for rehabilitation of the Worcester Consolidated Street Railway system also provide for the tentative purchase of 50 new cars, to cost \$700,000. This is out of a total of \$1,000,000, which it is believed will cover immediate requirements of the system. The balance of \$300,000 will go for the purchase and laying of new rails.

George Dwight Pratt, a member of the board of directors of the New Haven road, stated that the plan as approved was in keeping with the original promises held out by officials of the New Haven road when they sought to reacquire control over the street railway companies. Details of the rehabilitation had not yet been fully worked out, as a great deal depended on what the cities intended to do for the future improvement of the streets through which car lines run. He added that as soon as the City Councils approved the final plan agreed upon the New Haven road would proceed with the work.

The New York, New Haven & Hart-

ford Railroad is not expected to place any requisitions for cars or rails until the control of the two companies by the New Haven has been certified by the Public Utilities Commission.

\$700,000 a Year for Improvements in Ottawa

Ottawa, the seat of the government of Canada, is a city of about 125,000. It has 54 miles of electric railway, operated by the Ottawa Electric Railway. By comparison with cities of the first magnitude, Ottawa does not rank so very high, but the company there has been doing big things with its electric railway to keep it up to par or a little better. Thus in the last three years more than \$2,000,000 has been spent on the modernization of the railway. New cars and motor coaches and track extensions into new districts account for the major part of this sum. A power station on Albert Street, another on Holland Avenue, work shops on Elm Street, a new home for the line department, a garage and many other similar items have been added to the plant.

The new car shops on Elm Street and Champagne Avenue were erected at a cost of \$250,000. They cover nearly 100,000 sq. ft. of ground and embody the best features and latest mechanical devices of the most modern shops. They are designed to meet the requirements, not of today only, but of many far-off tomorrows.

Additions to power plant include two new substations, one on Albert Street and one on Holland Avenue, and 3 miles of conduit, which saved the erection of many unsightly poles.

A modern garage has been erected on Albert Street, for the fleet of O.E.R. motor coaches. This garage is up to date, being fitted with motor-driven ventilators to combat the deadly exhaust gases.

A considerable portion of the expenditure is being devoted to renewal of tracks. The north track on Sparks Street was relaid last summer. Rails weighing 122 lb. to the yard have taken the place of the 90-lb. steel laid there in 1912. It is probable that the south track on Sparks Street will be replaced with the new type rail next year.

A new home for the line department and two new "trouble trucks," minimizing delays in the service when emergent repairs are needed; the installation of the Hull Loop and station, making possible the use of double-truck cars on the St. Patrick Street line; the reorganization of the overhead structure, the construction of dams at the Chaudière, the replacement in many places of ungainly cedar poles by artistic iron uprights—here a dollar, there a hundred thousand—are among the many features of the future program.

San Francisco Expenditure for Cars \$250,000

Current reports make it appear that the Board of Public Works of San Francisco, Cal., is all set to award to the St. Louis Car Company, St. Louis, Mo., the contract for the construction of fifteen car bodies for the Municipal Railway. The reported price at which

the work will be let is \$9,634 for each body. The matter of the purchase of these cars has been agitated for a long while. Only a few weeks ago the Board of Public Works approved an appropriation of \$100,000 to purchase trucks and motors intended for use under these cars. The combined expenditure totals \$250,000, or something less than \$16,000 a car complete.

Improvements in Cars Operated Between Rochester and Syracuse

Transformation of the present inter-urban trolley cars operated between Rochester and Syracuse, N. Y., by the Rochester & Syracuse Railroad into up-to-date chair cars will take place about Dec. 15. The present double seats will be taken out and chairs upholstered in leather and mohair will be substituted. The present windows and wooden sash will be supplanted by 40-in. steel sash set in steel frames, giving passengers a better view of the scenery along the route.

Motor and Equipment Prices Reduced

Announcement has been made by the General Electric Company that prices on railway motors and car equipments have been reduced approximately 5 per cent, effective from Dec. 1. This reduction is the result of greater economies due to a consolidation of all railway manufacturing and engineering at the Erie, Pa., plant of the company.

According to the policy of the General Electric Company, when economies in engineering or manufacturing are effected, they are reflected in the prices of the electrical product to the operating companies.

A reduction in prices on its general-purpose motors, amounting to 5 per cent on most lines and 10 per cent on commonly used sizes of squirrel-cage induction motors, has also been made effective since Dec. 1. The motors affected by the new price levels include both alternating-current and direct-current constant and variable-speed general-purpose motors, from 1 hp. to 200 hp. Prices of standard squirrel-cage induction motors have now been brought to a level within about 10 per cent of that in 1914.

Coincident with this reduction in prices the company has announced a unified schedule of discounts for different classes of purchasers. The discount for quantity purchased at one time, on one firm order, has been made uniform on a sliding schedule for all classes of buyers. The company states that these reductions have been made possible by improved manufacturing processes and quantity production.

Swiss Electric Locomotives for Spain

In competition with German, British, American, French and other Swiss concerns the Oerlikon Maschinenfabrik of Oerlikon, has just secured a contract for the supply of 22 heavy electric locomotives for use on the electrified section of the North of Spain Railroads.

The mechanical portion of the engine

Adelaide Will Have 22 Additional Garfords



Seven Garford Model CB double-deck buses are in daily operation by the South Australian Railways on the streets of Adelaide, Australia. The company has found these units to be very satisfactory for its own operating requirements, and accordingly has placed an order with the Garford Motor Truck Company for 22 additional units of similar design. The first seven were placed in service early this year.

The buses, one of which is shown above, operate over what is known as the Adelaide-Glenelg route, cover-

ing a distance of 17 miles per round trip. They are operated from 6 a.m. until midnight, and a total of 204 miles a day is averaged by each bus. Fifty-eight seated passengers may be accommodated.

The body, built by the South Australian Railways, is mounted on Garford Model CB chassis, which is powered with the large type Z Wisconsin six-cylinder engine, rated at 48.6 hp. S.A.E., and capable of developing 105 hp. The chassis is equipped with four wheel air brakes and dual pneumatic tires in the rear. Its wheelbase is 220 in.

is to be built in Spain by the Compania Euskalduna de Construcción y Reparación de Buques, Bilbao. The system being adopted on the lines is the same as the neighboring French railroads, i.e., continuous current with a pressure at overhead conductor having a normal value of 1,500 volts and variable between 1,100 and 1,800 volts. The locomotives are to be capable of hauling a maximum weight of 1,200 tons, excluding the weight of locomotive. The maximum speed is 56 m.p.h. The engines will be carried by two six-wheel bogies and provided at either end with driver's cab.

The high and low-tension gears are arranged in the center of the locomotive, while two passages insure communication between the two driver's cabs.

Each of the six axles will be driven by a separate motor, the torque being transmitted through reduction gear with a ratio of 1:4.94. The three motors of each bogie will be connected in series, so that the pressure applied to the motors individually will amount to 500 volts.

Exports of Electric Railway Equipment Are Listed

Interesting monthly figures on the exports of railway motors, electric locomotives, starting and controlling equipment for electric railways and vehicle motors, railway signals, switches and attachments are now being prepared by the bureau of foreign and domestic commerce of the United

Countries	Railway Motors		Electric Locomotives — Railway —		Mining and Industrial		Starting and Controlling Equipment for Electric Railway and Vehicle Motors, Dollars	Railway Signal Switches and Attachments, Dollars
	No.	Dollars	No.	Dollars	No.	Dollars		
Italy.....	2	1,200	.....	.....	.....	.....	9,200	60
Netherlands.....	.....	.....	.....	.....	.....	.....	400	.....
Portugal.....	.....	.....	.....	.....	.....	.....	.....	1,390
Spain.....	12	15,106	.....	.....	.....	.....	.....	1,000
Sweden.....	.....	.....	.....	.....	1	4,648	.....	2,071
United Kingdom.....	.....	.....	.....	.....	.....	.....	686	10,265
Canada.....	3	1,981	.....	.....	.....	.....	.....	909
Guatemala.....	.....	.....	.....	.....	.....	.....	.....	.....
Honduras.....	.....	.....	.....	.....	.....	.....	260	.....
Nicaragua.....	.....	.....	.....	.....	.....	.....	.....	218
Panama.....	.....	.....	.....	.....	.....	.....	1,085	2,201
Mexico.....	.....	.....	.....	.....	1	5,369	.....	.....
Newfoundland and Labrador	1	1,032	.....	.....	.....	.....	.....	2,435
Cuba.....	.....	.....	.....	.....	.....	.....	.....	47
Dominican Republic.....	.....	.....	.....	.....	.....	.....	.....	.....
Argentina.....	.....	.....	.....	.....	.....	.....	.....	.....
Brazil.....	10	7,208	2	163,200	3	11,790	2,698	16
Chile.....	40	23,040	7	186,305	5	66,977	.....	207
Colombia.....	10	4,829	.....	.....	.....	.....	2,177	34
Ecuador.....	.....	.....	.....	.....	.....	.....	.....	.....
Peru.....	8	5,800	.....	.....	.....	.....	.....	.....
British India.....	6	7,935	.....	.....	.....	.....	.....	.....
Japan, including Chosen.....	.....	.....	.....	.....	1	6,054	.....	.....
Australia.....	88	123,751	.....	.....	.....	.....	1,895	13,780
British South Africa.....	16	13,770	.....	.....	1	3,600	457	597
Total.....	196	205,652	9	349,505	12	98,438	18,896	36,158

States Department of Commerce. The figures are listed by countries and in the cases of motors and locomotives the quantities as well as the costs are given. The statistics shown in the table on page 1031 are for the month of September, 1926.

Important Bearing Data Assembled

The new Timken Engineering Journal, a loose-leaf book of 110 pages, contains technical information relative to the application of Timken bearings to automotive and industrial machinery. A number of pages are devoted to the explanation of the Timken bearing as manufactured at the present time. Exclusive features such as the positive alignment of the rolls, one-piece precision cage and special alloy steel are explained. Typical problems, with the solutions, involving the calculation of various loads and the selection of suitable bearings are given. Tables showing bearing ratings, capacities and dimensions as well as speed capacity curves are included.

Methods of mounting Timken bearings, shaft and housing design, adjustment of Timken bearings, closures, cup and cone fitting practices, assembly methods and lubrication are treated in separate chapters. A full set of dimension sheets accurately drawn to scale, together with formulas and recommendations for the application of Timken bearings, developed through experience gained in successfully applying more than 150,000,000 bearings, comprise another section.

Galena Signal Oil Officers Resign

Changes are announced in the personnel of the Galena Signal Oil Company, New York. L. J. Drake, president; George A. Barnes, vice-president, and J. C. Tipton, manager of the foreign department, have all withdrawn from the company, Mr. Drake after 25 years of service, Mr. Barnes after 30 years and Mr. Tipton after 20 years. Their resignations went into effect on Nov. 1. It is not expected that permanent officers to succeed them will be elected until early in the new year. All of the retiring officials are well known in the electric railway field, in supplying which with lubricants the company long specialized.

Metal, Coal and Material Prices

Metals—New York		Nov. 30, 1926
Copper, electrolytic, cents per lb.	13.375	
Copper wire, cents per lb.	15.875	
Lead, cents per lb.	8.00	
Zinc, cents per lb.	7.46	
Tin, Straits, cents per lb.	71.625	
Bituminous coal, f.o.b. Mines		
Smokeless mine run, f.o.b. vessel, Hampton Roads, gross tons	\$7.00	
Somerset mine run, Boston, net tons	3.00	
Pittsburgh mine run, Pittsburgh, net tons	2.425	
Franklin, Ill., screenings, Chicago, net tons	1.875	
Central, Ill., screenings, Chicago, net tons	1.625	
Kansas screenings, Kansas City, net tons	2.35	
Materials		
Rubber-covered wire, N. Y., No. 14, per 1,000 ft.	\$6.00	
Weatherproof wire, base, N. Y., cents per lb.	17.50	
Cement, Chicago net p'ces, without bags	2.10	
Lined oil (5-bbl. lot), N. Y., cents per lb.	11.4	
White lead in oil (100-lb. keg), N. Y., cents per lb.	14.75	
Turpentine (bbl. lot), N. Y., per gal.	\$0.89	

Rolling Stock

Hamilton Street Railway, Hamilton, Ont., Canada, through its owner, the Dominion Power & Transmission Company, has awarded a contract to the National Steel Car Company, Hamilton, for 24 new cars to cost \$480,000.

Ottawa Electric Railway, Ottawa, Canada, has included in its program of expenditures for the future the purchase of two new "trouble trucks."

Municipal Railway of St. Petersburg, St. Petersburg, Fla., received on Nov. 1 the eight cars ordered on May 17, 1926. Specifications on this equipment, referred to in the *ELECTRIC RAILWAY JOURNAL*, issue of May 22, page 910, are as follows:

Builder of car body	Brill
Type of car	One-man double-truck pass.
Seating capacity	46
Weights:	
Car body	13,700 lb.
Trucks	10,500 lb.
Equipment	6,250 lb.
Total	30,450 lb.
Bolster centers, length	17 ft. 10 in.
Length over all	40 ft. 1 in.
Truck wheelbase	5 ft. 1 1/2 in.
Width over all	8 ft. 6 in.
Height, rail to trolley base	11 ft. 6 in.
Body	Steel
Interior trim	Mahogany
Headlining	Agasote
Roof	Arch
Air brakes	Westinghouse
Armature bearings	Sleeve
Axles	4-in.
Bumpers	5-in. channels
Car signal system	Faraday
Car trimmings	Aluminum
Center and side bearings	Brill
Conduits and junction boxes	Brill
Control	K-35
Couplers	Brill
Curtain fixtures	Curtain Supply Company
Curtain material	Pantasote
Destination signs	Hunter
Door-operating mechanism	National Pneumatic
Fare boxes	Johnson
Finish	Color and varnish system
Fenders or wheelguards	H-B
Gears and pinions	Helical, four cars; spur, four cars
Hand brakes	Brill
Heater equipment	None
Headlights	Golden Glow
Journal bearings	Brill
Journal boxes	Brill
Lightning arresters	K-3, four cars; MD-3, four cars
Motors	Westinghouse 506, four cars; GE-264, four cars; all inside hung
Safety car devices	Safety Car Devices Company
Sash fixtures	Brill, all metal
Seats	Brill Winner 201-A
Seating material	Brown leather
Slack adjuster	Sauvage
Springs	Brill
Step treads	Kass
Trolley catchers	Earll
Trolley base	Nuttall 20-A
Trolley wheels	Ideal
Trucks	Brill 77-E1
Ventilators	Brill
Wheels	Cast chilled, 26-in.
Special devices	Fleets door hinges; Westinghouse Traction Brake Co. C-6 feed valve

Trade Notes

Electric Controller & Manufacturing Company, Cleveland, Ohio, announces the appointment of the Farr Electric Service, Inc., 228 W. South Temple, Salt Lake City, Utah, as its representative.

Silver Lake Company, Newtonville, Mass., which has been manufacturing braided cords in its plant since 1858, has organized a subsidiary plant at Chattahoochee, Ga. This new plant will occupy about 65,000 sq ft. of floor space and will produce such grades of sash cord as can be manufactured most

economically in that section. The preparation processes are to be manufactured by the Whittier Mills Company, which has recently completed a plant for this special purpose. The two plants are under the same management. All sales will continue to be made, as in the past, from the general offices of the Silver Lake Company at Newtonville.

New Advertising Literature

American Strombos Company, Inc., Philadelphia, Pa., has published bulletin No. 82, describing the Strombos air signal for locomotives, motor and electric cars. The signal may also be used in yards and in signal towers.

Westinghouse Electric & Manufacturing Company, East Pittsburgh, Pa., will gladly send copies of folder 4712, which illustrates and describes various important features of the company's exhibit at the A.E.R.A. convention in Cleveland. This eight-page folder covers the latest apparatus developments of the industry.

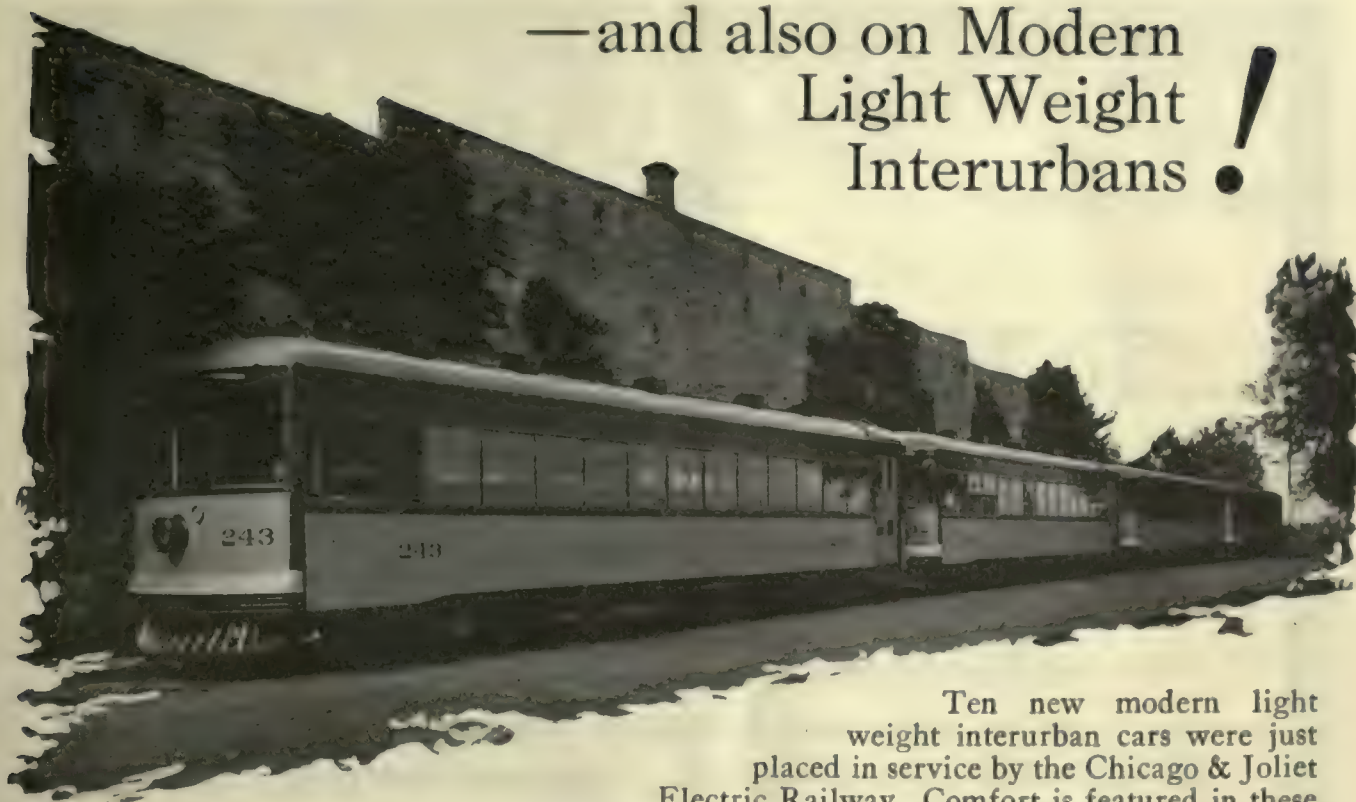
Carnegie Steel Company, Pittsburgh, Pa., has issued a new booklet entitled "Wrought Steel Wheels and Other Circular Sections—Forged Steel Axles." The design and specifications contained in this catalog have been completely revised and brought up to date.

General Electric Company, Schenectady, N. Y., has issued "Silent Gears," a publication of 28 pages devoted to its Fabrolite and Textolite products, manufactured by it solely for the purpose of making silent gears. They differ only in the method of fabrication and not in basic materials. The company says that the history of the development of these silent gears goes back to 1908, when John Miller, chief millwright of the Schenectady Works of the General Electric Company, being aware of the necessity for such a gear, started a long series of experiments to find a material that would prove suitable. His work along these lines resulted in a radically new type of gear, which from the first proved highly successful, and which was the prototype of the modern fabrolite gear.

Sanford Mills, Sanford, Me., has issued a booklet describing the use of Chase Velmo mohair velvet for bus upholstery. Velmo upholstery has been in use in railroad service over a long period of years. It has now been adopted for bus upholstery as well.

Morton Manufacturing Company, Chicago, Ill., announces that during the early days of January, 1927, it will receive for distribution a new catalog covering all of the items included in the Acme line of railway appliances and industrial steel products. Mr. Morton states that every attention has been given to the preparation of this book calculated to make it as comprehensive as possible, consistent with simplicity of form and intelligent presentation and description of the products which it represents. Those desiring copies of the new catalog should communicate with the Morton representative in their district or direct with the general offices at Chicago.

—and also on Modern
Light Weight
Interurbans !



Ten new modern light weight interurban cars were just placed in service by the Chicago & Joliet Electric Railway. Comfort is featured in these new one-man cars, six of which are of the single-end type, while four are for double end operation. Of course

Peacock Staffless Brakes

are part of the equipment of these ultra-modern interurbans. Note in the picture the minimum platform space occupied by the Peacock Staffless at the left of the motorman's seat. This is one of the many features which make Peacock Staffless so popular with modern car buyers. And they have three times the braking power of ordinary hand brakes.

We will gladly send you facts and figures proving what these brakes have done for others and what they will do for your cars.



National Brake Company, Inc.

890 Ellicott Square

Buffalo, N. Y.

Canadian Representative: Lyman Tube & Supply Co., Ltd., Montreal, Can.





To Hold the Confidence of the State

Public utility commissioners are human. As representatives of the state they demand and expect a cold and impersonal presentation of facts. Yet as men they cannot fail to appreciate a full and candid laying of the cards upon the table by any utility before them.

An American Appraisal and Rate Study can constitute one of the most important of these cards. It is complete in its presentation of the facts. Its conclusions are in every instance verifiable. Its disinterestedness is unassailable. Its findings are ordered and classified as the commissioners would have them. It constitutes, in brief, an ideal basis upon which to reach prompt and amicable agreement upon any issue involving the analysis and valuation of property.

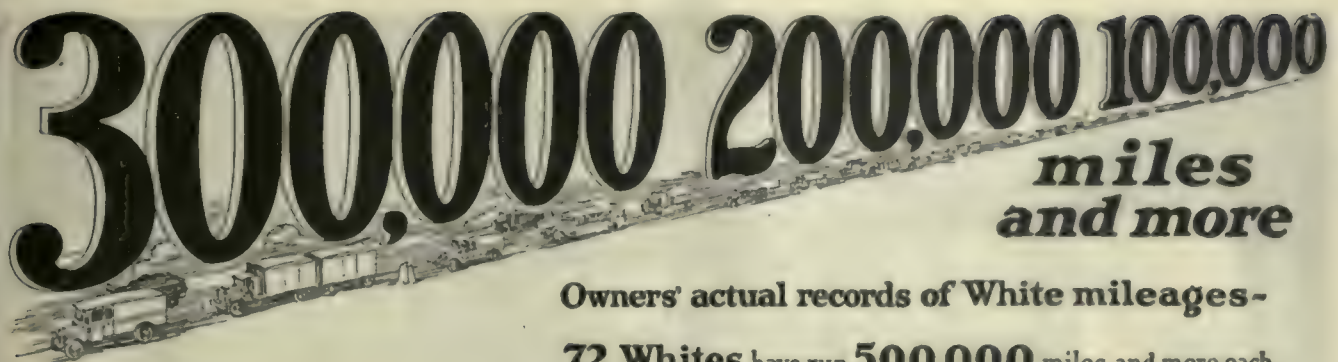
The American Appraisal Company

MILWAUKEE

PUBLIC UTILITIES • INDUSTRIALS • REAL ESTATE PROPERTIES • NATURAL RESOURCES

A NATIONAL ORGANIZATION

300,000 200,000 100,000 miles and more



Owners' actual records of White mileages—

72 Whites have run **500,000** miles and more each
384 have run between **300,000** and **500,000** miles each
951 have run between **200,000** and **300,000** miles each
1658 have run between **150,000** and **200,000** miles each
4959 have run between **100,000** and **150,000** miles each

giving the astounding total—

8024 Whites have run **100,000** miles and more each



No owner will operate a truck or bus long enough to run 100,000 miles, unless those miles are *money-earning miles*

100,000 miles—White miles—mean more than an exceptionally long distance; more than an exceedingly durable, well-built, well-served motor truck or bus.

They mean unusual profits. They mean net earnings—in excess of all costs. They mean continued earnings long after the original cost has been written off the books.

200,000 miles mean all that—doubled. 300,000 miles mean all that—trebled. So on Picture the earnings of the scores of Whites that have exceeded 500,000 miles. Then picture what these mileages would mean in your own business, knowing your average mileages for a week or a month or a year.

White 100,000-mile records are not isolated performances, not special achievements under especially favorable conditions. Whites, by the thousand, exceed 100,000 miles with a regularity that makes it standard performance. . . . All models do it. They do it in all lines of business. They do

it everywhere, under all conditions of load, road, weather and climate. They do it in fleets and in single installations.

More than 8,000 Whites have run 100,000 miles and more. More than 1,400 have run 200,000 miles or more. More than 400 have exceeded 300,000 miles. The original cost of most of these 8,024 Whites has been written off the owners' books. . . . And these mileages are actual owners' figures. They do not include many hundreds of additional Whites that have passed 100,000 miles, but whose owners have not sent us accurate records. Neither do they mirror the splendid earning records of thousands of Whites that have been serving dependably for ten, twelve, fourteen years, carrying their pay loads, without reaching the 100,000-mile mark.

This record, published annually, stands alone. No other truck manufacturer has ever published such a volume of evidence of dependability, long life and continuous earning power. No other truck manufacturer can.

THE WHITE COMPANY, CLEVELAND

Our new "300,000 Miles and More" booklet is just out, with the names of all the owners and the number of Whites each owns in each mileage classification. You will find leaders in all industries, firms in your own line of business, your neighbors, your business associates. We will gladly send the booklet free. Write for it.

Before you buy a truck or a bus see the Whites at any of our 75 factory branches or 500 dealers. There is a White model to meet every transportation need.

Truck Chassis

Model 15	— ¾-Ton	.....\$2,150
Model 20	— 2-Ton	.....2,950
Model 51	— 2½-Ton	.....3,750
Model 40-A	— 3½-Ton	.....4,350
Model 52	— Heavy Duty	.....5,100

(Several types of power dumping bodies and bodies available)

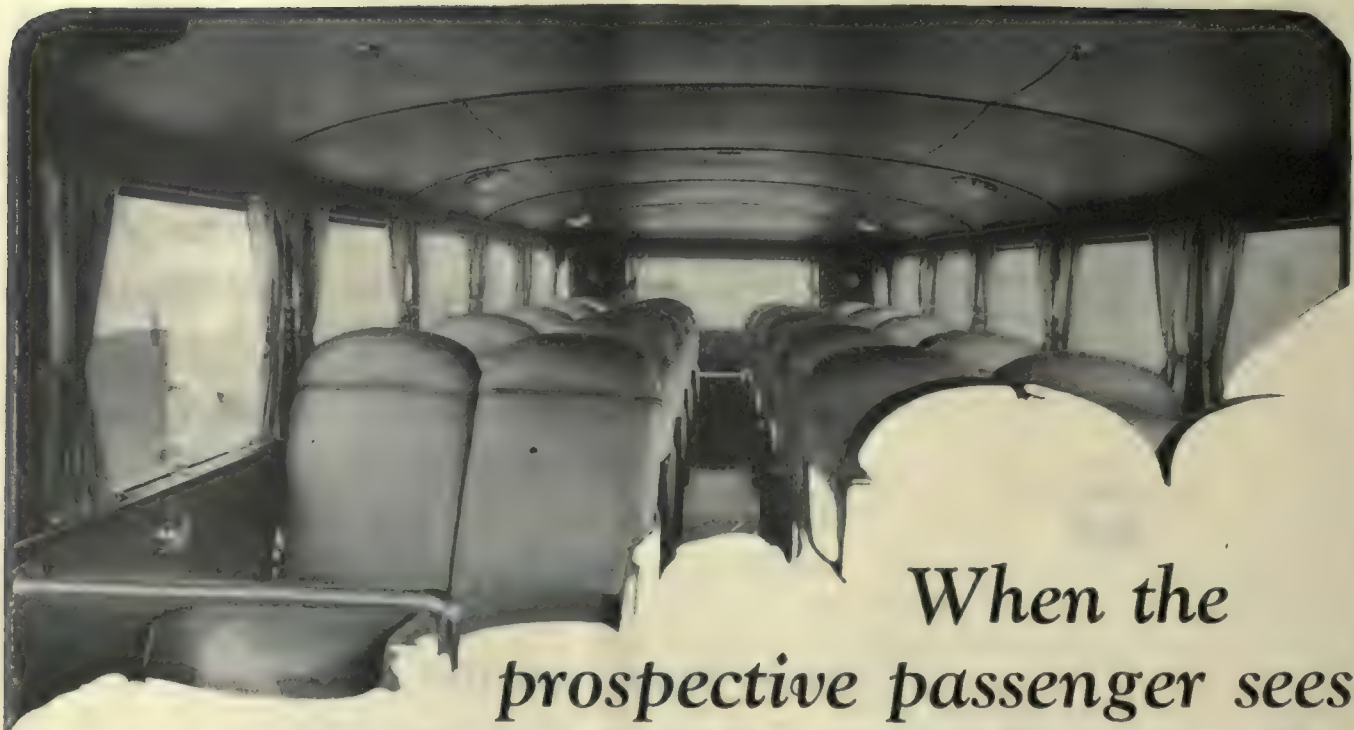
Bus Chassis

Model 53	..... 16 to 21 passengers	.....\$4,250
Model 50-B	..... 25 to 29 passengers	.....5,350

(All prices f.o.b. Cleveland)

WHITE TRUCKS

AND WHITE BUSES



When the prospective passenger sees Real Leather Upholstery

he feels that he is going to have a clean, comfortable trip.

In selling rides, nothing counts more than the seats the passenger sits in and the appearance of the bus or car interior.

Real Leather upholstery is richer looking, more comfortable, cleaner and will wear longer than any other seat covering.

Hand Buffs, Machine Buffs and Special Machine Buffs available in several finishes and colors will help you sell transportation and simplify the problem of keeping your bus and street car interiors looking their best. We are in a position to offer quotations on complete hides or on leather cut to pattern:

Booklets containing
samples and
description of
our many grades
and finishes
gladly sent.

The Cleveland Tanning Company

Dennison Avenue & Jennings Road, Cleveland, Ohio

Western Representative:
Midgeley & Borrowdale,
McCormick Building,
Chicago, Ill.



Eastern Representative:
L. D. Rockwell Co.,
National City Building,
New York City

HYALINE

The Finest Coach Leather Obtainable



Dollars Earned, Miles Run, and Work Well Done

Graham Brothers Trucks and Motor Coaches are known the world over for unfailing records of dollars earned, miles run, and work well done.

They are quality trucks and motor coaches, built complete in sizes and body styles to fit the needs of your business. They are priced low. They are serviced

quickly, skillfully and reasonably by Dodge Brothers dealers everywhere.

The G-B emblem marks a truck or motor coach that will work well and ably day in and day out, live long, cost little and make money for its owner.

GRAHAM BROTHERS

Evansville - DETROIT - Stockton
A DIVISION OF DODGE BROTHERS, INC.
GRAHAM BROTHERS (CANADA) LIMITED - TORONTO, ONTARIO

1-TON CHASSIS, (G-BOY) - \$ 885
1½-TON CHASSIS - - - - 1245
2-TON CHASSIS (Disc Wheels 1445
With Dual Rear, Optional)

21-PASSENGER MOTOR COACH
STREET CAR TYPE - \$3815
12-PASSENGER
PARLOR COACH - - 3750

f. o. b. Detroit

GRAHAM BROTHERS MOTOR COACHES

SOLD BY DODGE BROTHERS DEALERS EVERYWHERE



Comfort & Long Wear— Ideally Combined

It is easy to see why this balloon tire construction makes the ideal combination.

Four plies of cords at side-walls allow the extreme flexing action under low air pressure, which puts comfort into balloon tires. Six plies of cords under the tread give the necessary protection against punctures and road wear.

INDIA automobile balloons and bus balloons (with 6-8 plies, etc.) have proved the value of this INDIA patented construction.

Go to an INDIA dealer and see how the INDIA balloon is made. Try one—with a True-Blue (HEAT-PROOF) Inner Tube. You'll then understand better why it is that INDIA balloons give you the utmost *uninterrupted* mileage you can buy.

INDIA TIRES



INDIA TIRE & RUBBER CO., AKRON, OHIO.

WINDOWS DO MAKE A DIFFERENCE



Bus for Third Avenue Railway, New York City, with Edwards Metal Sash. Body by Paterson Vehicle Co., Pierce-Arrow Chassis.

Minus Maintenance

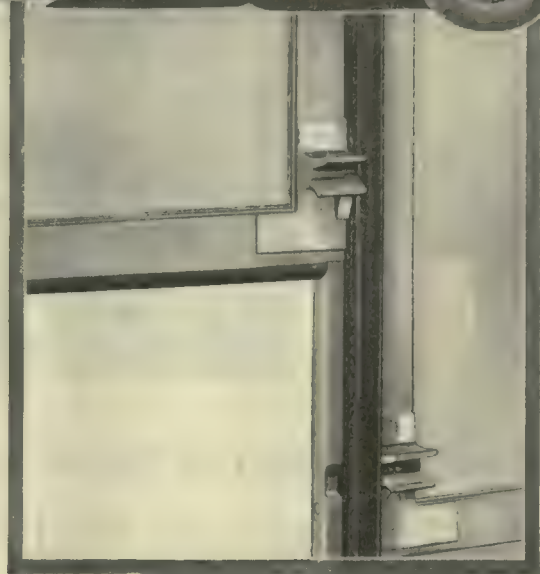
The test of time—on hundreds of bus bodies, in every part of North America, under every conceivable condition—has proved this:

That Edwards Metal Sash seldom calls for time or replacement parts.

Its maintenance expense can be considered as practically zero.

And this economy spreads to the entire window, for snapping glass is effectively prevented, and the absence of dirt pockets makes window washing a simple matter.

To specify Edwards Metal Sash means a long stride in the march to minimum maintenance.



Edwards Storm Sash removes all the difficulties out of bus heating. Put them to work for you this winter.

O. M. EDWARDS CO.

New York Syracuse, N. Y. Chicago

Canadian Representatives: Lyman Tube & Supply Co., Ltd.,
Montreal and Toronto

Edwards Metal Sash



H-K Seats on new interurban cars for the Chicago & Joliet Electric Ry.

To quote portions from a recent editorial in *Electric Railway Journal*:

"In the single-end, one-man type interurban cars, seats are provided for 52 passengers on double bucket-type chairs. These are the feature of the car. They are . . . upholstered in green plush . . . while the trimming, back and arms are in genuine green leather.

"Design of the double-end car is similar to that of the single-end, with the exception that reversible seats upholstered in green plush replace the bucket-type seats."

The seat referred to above is the 900-D type. Whatever your requirements may be, write for our Catalog to get full particulars of H-K seats for both bus and car

HALE-KILBURN COMPANY

General Offices and Works: 1800 Lehigh Avenue, Philadelphia

SALES OFFICES:

Hale-Kilburn Co., 30 Church St., New York
Hale-Kilburn Co., McCormick Bldg., Chicago
E. A. Thornwell, Candler Bldg., Atlanta

Frank F. Boller, 903 Monadnock Bldg.,
San Francisco
Chris Ezeles, 320 S. San Pedro St., Los Angeles
T. C. Coleman & Son, Starks Bldg., Louisville

W. L. Jefferies, Jr., Mutual Bldg., Richmond
W. D. Jenkins, Praetorian Bldg., Dallas, Texas
W. D. Jenkins, Carter Bldg., Houston, Texas
H. M. Euler, 46 Front St., Portland, Oregon

Hale and Kilburn SEATS



MODERN *Light Weight Cars*

for city or interurban service

The attractiveness and comfort of these cars will produce a material increase in riding.

By replacing heavy two-man operated cars with these lighter one-man operated cars, a material reduction in operating expense will be effected.

CUMMINGS CAR AND COACH COMPANY

Successor to McGuire-Cummings Mfg. Co.

111 W. Monroe Street

CHICAGO

Gas Electric Motor Coaches

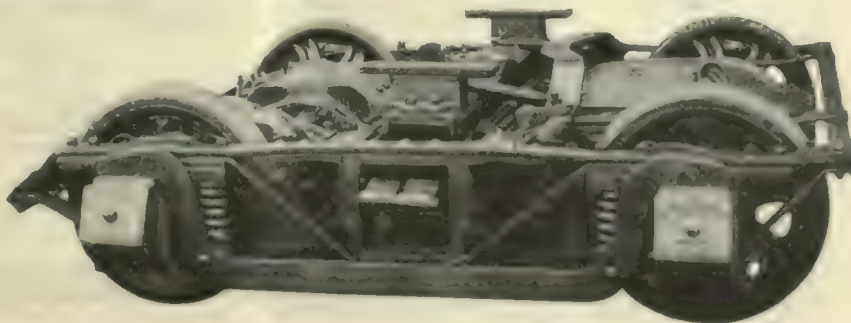
Snow Sweepers and Plows

Light Weight City and Interurban Cars

No. 62 Forged Steel Equalized
Frame Type Truck

With A.E.R.A. Standard Journals.

Designed for Light Weight Car
Bodies for either City or Inter-
urban Service.



To economize— BOYERIZE!

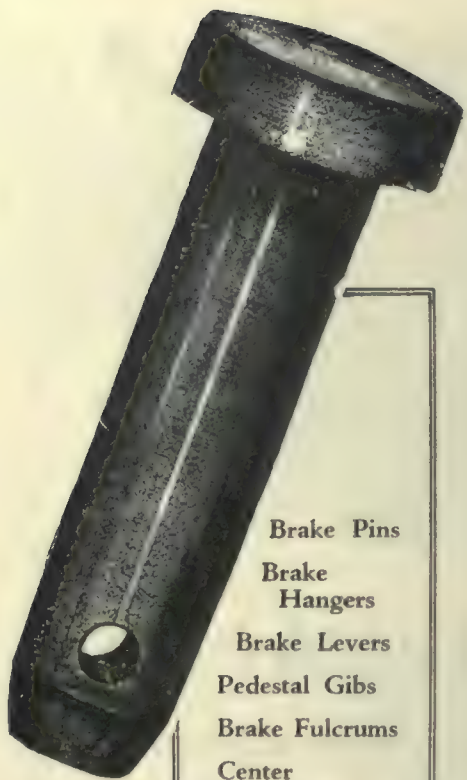
Modern maintenance practices pay! Ancient methods of maintenance have no place in modern car shops. They are an economic waste.

Modern Boyerized Car Parts also pay! They keep operating expenses down to the minimum! They outlast standard steel parts three to four times!

The exceptional service given by car parts treated by the Boyerizing Process is directly responsible for their tremendous popularity in the electric railway field.

Are you skeptical? Try Boyerized Car Parts under your own operating conditions and note their ability to stand up under the most severe service. This test will prove that to Boyerize is to economize!

Look over the list of Boyerized Parts. Order a sufficient quantity of the items you need to make a fair test. We know the result of such tests will result in your standardizing on Boyerized Parts.



- Brake Pins
- Brake Hangers
- Brake Levers
- Pedestal Gibs
- Brake Fulcrums
- Center Bearings
- Side Bearings
- Spring Post Bushings
- Brake Bushings
- Bronze Bearings
- Bolster and Transcom Chafing Plates
- Spring Posts
- McArthur Turnbuckles
- Manganese Brake Heads
- Manganese Truck Parts



Bemis Car Truck Company

Electric Railway Supplies

Springfield, Mass.

Representatives:

Economy Electric Devices Co., Old Colony Bldg., Chicago, Ill.
 F. F. Bodler, 903 Monadnock Bldg., San Francisco, Cal.
 W. F. McKenney, 54 First Street, Portland, Ore.
 L. H. Denton, 1328 Broadway, New York City, N. Y.
 A. W. Arlin, 772 Pacific Electric Bldg., Los Angeles, Cal.



Comfortable Cars for Contented Passengers!

EQUIP your lines with St. Louis-built "Quality Cars"—a real reason for the public to leave its automobiles at home and ride the rails in safety and comfort.



Double End Double Truck City Car

New and Better Designed Cars
to meet the demands of a
Discriminating Public
for further particulars, write

St. Louis Car Company

St. Louis, Mo.

"The Birthplace of the Safety Car"



One of the new modern street cars recently received
from the car manufacturers by

The Birmingham Electric Co.

ALL EQUIPPED WITH CHILLED WHEELS

Greatest co-efficient of brake-
shoe friction developed with
CHILLED WHEELS

—Stands for safety in emergencies—

Cost Less Per Car Mile

A.R.A. Standards

650 lb. Wheel for 30 Ton Cars
700 lb. Wheel for 40 Ton Cars
750 lb. Wheel for 50 Ton Cars
850 lb. Wheel for 70 Ton Cars

**ASSOCIATION OF MANUFACTURERS
OF CHILLED CAR WHEELS**

1847 McCormick Building
CHICAGO

50 Plants—Daily Capacities 20,000 Wheels



The Montreal Tramway car shown below was built by the Canadian Car and Foundry Company, Ltd., with PLYMETL side panels.



“Leger,” in French— “Light,” in English

THESE Montreal Tramway cars have to show all signs in both French and English. But they don't need to be labeled either “Leger” or “Light” for other electric railway men to see the lightweight advantage they possess through the use of PLYMETL side panels. The fifty new cars like this one, designed and built by the Canadian Car and Foundry Company, are daily piling up records of economy.

HASKELITE and PLYMETL are being praised in many languages. Their advantages are recognized in Spain, Australia, South America, etc. and the widespread demand for these structural plywood products is a true indication that these advantages are being translated into big profits.

May we send a list of prominent users and a blue print booklet showing the many street car and bus applications?

HASKELITE MANUFACTURING CORPORATION
133 West Washington Street
CHICAGO

Canadian Representatives:
Railway and Power Engineering Corporation, Ltd.,
Toronto

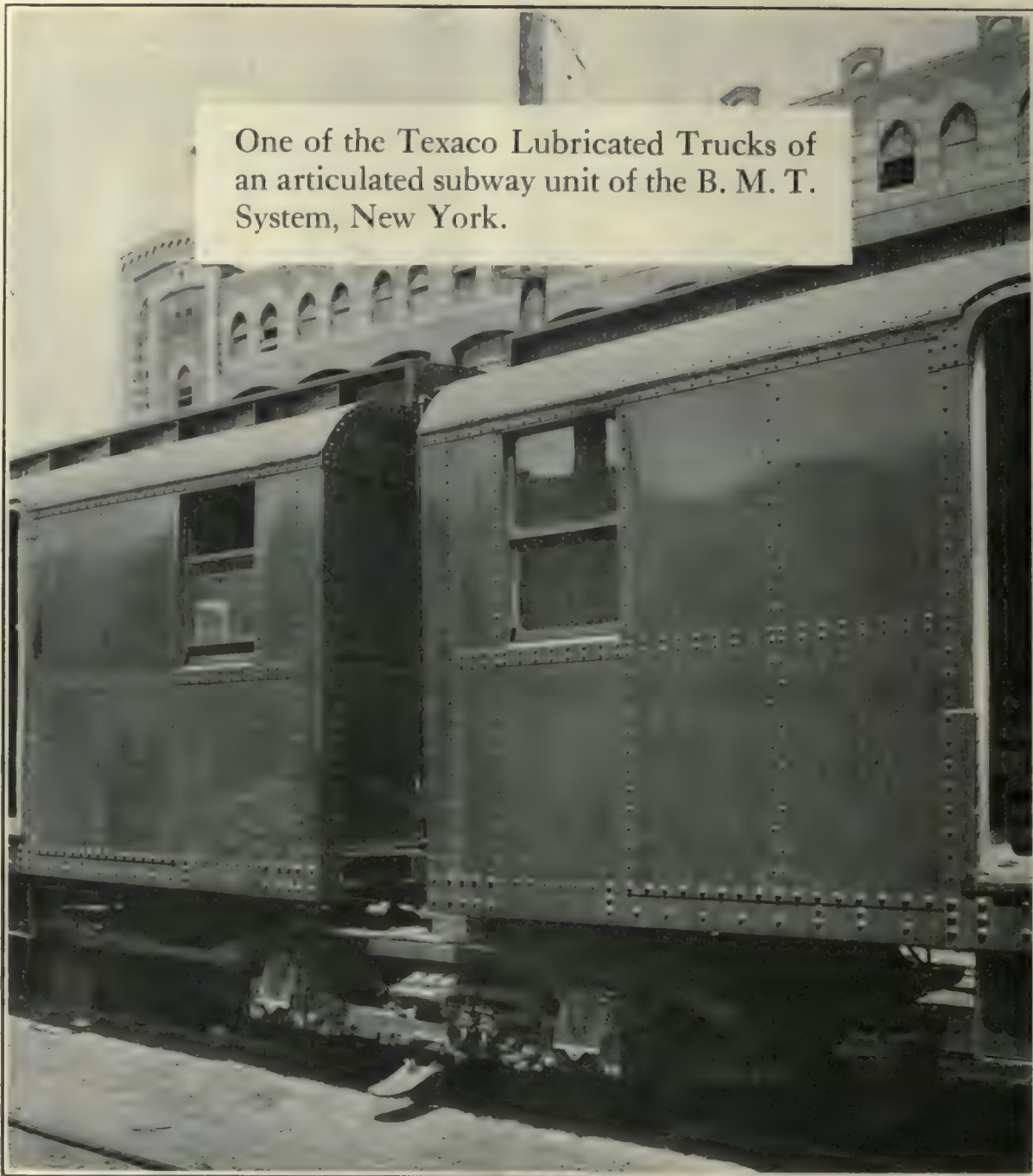
Montreal

Winnipeg

PLYWOOD
HASKELITE
PLYMETL

ERJ13-4Gray

One of the Texaco Lubricated Trucks of an articulated subway unit of the B. M. T. System, New York.



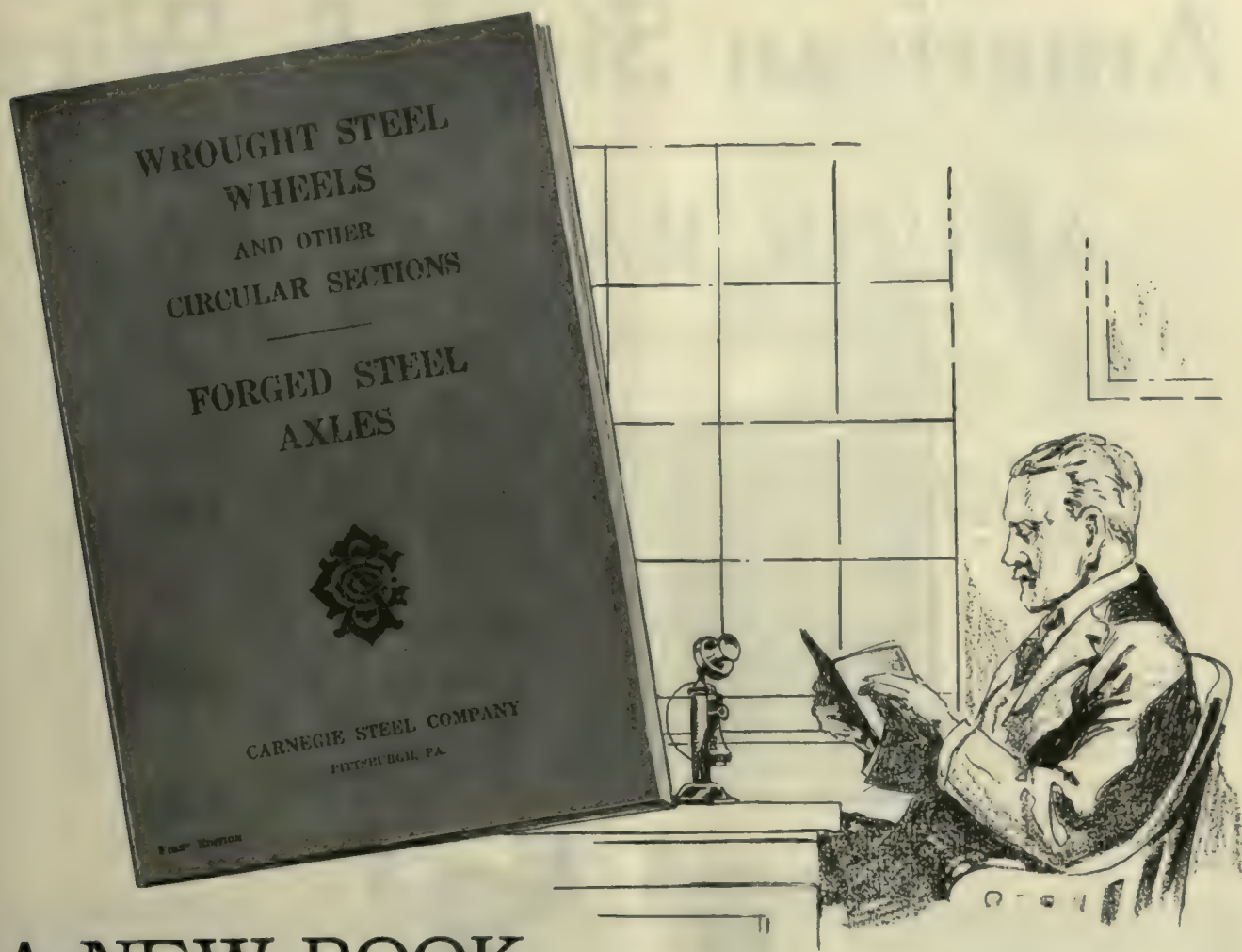
TEXACO



The Chosen Lubricant
of ELECTRIC RAILWAYS



The Texas Company, U. S. A., 17 Battery Place, New York City
OFFICES IN PRINCIPAL CITIES



A NEW BOOK that should be on your desk—

"Wrought Steel Wheels and Other Circular Sections—Forged Steel Axles" is just off the press. It combines in one volume the information previously contained in three separate books. It shows representative wheel and axle designs including the recognized standards, as well as a very complete list of specifications to which these commodities are most commonly ordered.

Incorporated are the changes made during 1924 by the American Railway Association and the American Society for Testing Materials in the specifications for steam railway wheels. In every way the book is complete and up-to-date. A copy is yours on request. Send for it to-day.

In the steam and electric railway fields, in the industrial field under cranes, hot metal cars, factory trucks, mine cars, etc., Carnegie Wheels are daily adding to the enviable record of "wrought steel". Wrought Steel Wheels will do the job better.

Use This Coupon



Carnegie Steel Co.
Carnegie Building
Pittsburgh, Pa.

Send me, without obligation on my part, a copy of your new book, "Wrought Steel Wheels and Other Circular Sections—Forged Steel Axles."

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1829A

American Steel & Wire Company's

ARCON RAIL BONDS

Trade Mark Registered



PATENTED

Arcon "A" Bond in detail
and installed

A NEW principle of design is embodied in Arcon Rail Bonds. *This is the open terminal.*

The open terminal has many distinct advantages. All terminals provide for easy arc manipulation. The end of the copper conductor is approximately one-eighth of an inch from the rail, and located in an open space which insures per-

fect welding of the copper wires. The sloping surface of the terminal after welding is a novel and important feature in arc weld bonds.

Be convinced by a practical demonstration which we will gladly give you at your convenience.

Prices and literature mailed upon request.

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DETROIT... Foot of First Street	OKLAHOMA CITY... First Nat'l Bank Bldg.	PITTSBURGH... Frick Building	BUFFALO... 670 Ellicott Street	SALT LAKE CITY... Walker Bk. Bldg.
CINCINNATI... Union Trust Building	BIRMINGHAM... Brown-Marx Bldg.	PHILADELPHIA... Widener Building	WILKES-BARRE... Miners Bk. Bldg.	
MINNEAPOLIS-ST. PAUL... Merchants Nat'l Bk. Bldg., St. Paul	MEMPHIS... Union and Planters Bank Bldg.	ATLANTA... 101 Marietta Street		

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Comfortable Riding

BECAUSE of the resiliency of wood, *International* Creosoted Ties cushion the inevitable pounding that the track and paving receive, and save much wear and tear on rolling stock.

And *International* Creosoted Ties are so carefully selected and seasoned, and so thoroughly impregnated under pressure with creosote oil to prevent decay, that they last as long as the rail itself. They are well graded, of uniform size and plainly marked to show the grade for which they were accepted.

Into each *International* Creosoted Tie is driven a copper monogrammed dating nail that forms a permanent record for future inspections.

It pays in the long run to use these high-grade ties because they are made to last—and they are cheapest because they last longest.

International Creosoting & Construction Co.
General Office—Galveston, Texas



Resiliency

Quality Ties
Ready for Shipment

Write or Wire Your Requirements



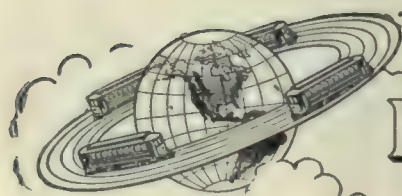
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The International
Dating Nail

International

HIGH GRADE CREOSOTED TIES

The creation and maintenance of car advertising space values requires the same degree of highly specialized knowledge as the construction and maintenance of railroads. Such tasks should be delegated only to those of widest experience and longest record of success.



Barron G. Collier

INCORPORATED

CANDLER BLDG. NEW YORK



Bates Steel Poles build public confidence

The electric railway today faces a serious need for improving its relations with the riding public. In view of growing competition of other modes of transportation a decided improvement in service and physical property is required to retain and regain public patronage and confidence.



Expanded
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No Rivets,
Bolts or
Welds
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One-Piece

Bates steel poles not only give superior service and longer life, but their sturdy, trim and unobtrusive appearance impresses the public favorably and inspires confidence in the transportation company as a sound enterprise.

Ask for a Bates Estimate on your requirements for any type of overhead supporting structure.

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STANDARD ELECTRIC CORP.
General Export Distributors

SAMUEL BROWN, LTD., *New Zealand*
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BATES-TRUSS

Expanded
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NO RIVETS
OR WELDS
—
ONE-PIECE

B E S T Bates Expanded Steel Truss Co.

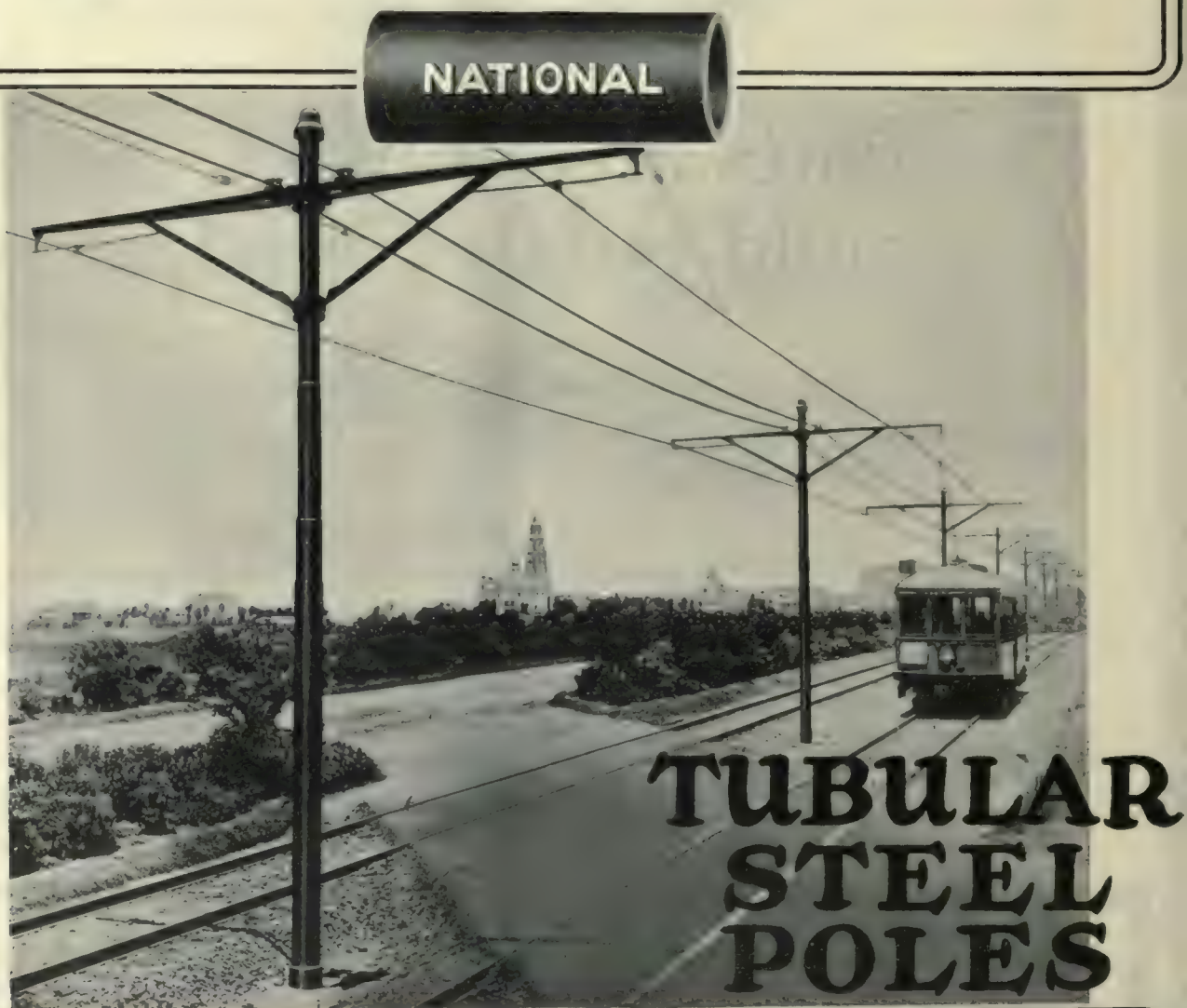
Sales, Engineering and Executive Offices
EAST CHICAGO, INDIANA

Preference from this standpoint

GENERAL dependability, the necessary factor demanded today in line poles, is represented in a high degree in "NATIONAL" Tubular Steel Poles—the principal reason for their preference by leading traction companies throughout the country.

Made by the largest manufacturer of tubular products in the world, by skilled workmen under expert supervision; put through severe tests which represent the hardest kind of service conditions—"NATIONAL" Poles include the desired advantages of durability—strength—lower upkeep—and attractiveness—which make up general dependability in service.

Note in the illustration below the clean-cut, neat appearance which "NATIONAL" Poles give to this electric line. Our engineers will be glad to cooperate with you and offer suggestions concerning installation of these poles. Bulletin No. 14—"NATIONAL" Tubular Steel Poles—will be sent upon request.



NATIONAL TUBE COMPANY, PITTSBURGH, PA.
District Sales Offices in The Larger Cities

Annual Statistical Number

January 1, 1927

Facts—

Evidence of the accomplishments of the industry are to the electric railway operator what soundings are to the navigator.

KNOWLEDGE, of what has happened and is to happen through the interpretation of authentic figures, forms the basis of his future plan of operation.

Every year the electric railway operator has turned to the Annual Statistical and Forecast Number (dated January 1, 1927) of *Electric Railway Journal* for the facts that should guide his operations. This important issue will include:

Forecast of the Industry's expenditures
Trends in costs and fares
Total buses purchased by the Industry
Miles of track constructed, re-constructed and extended
Number of cars purchased
Number of receiverships lifted
Reviews of basic tendencies in legal, financial and regulatory matters
Plus a host of other pertinent facts

LOOKED TO and consulted as an authority, to aid in constructive planning the issue is an essential part of the operation of the property.

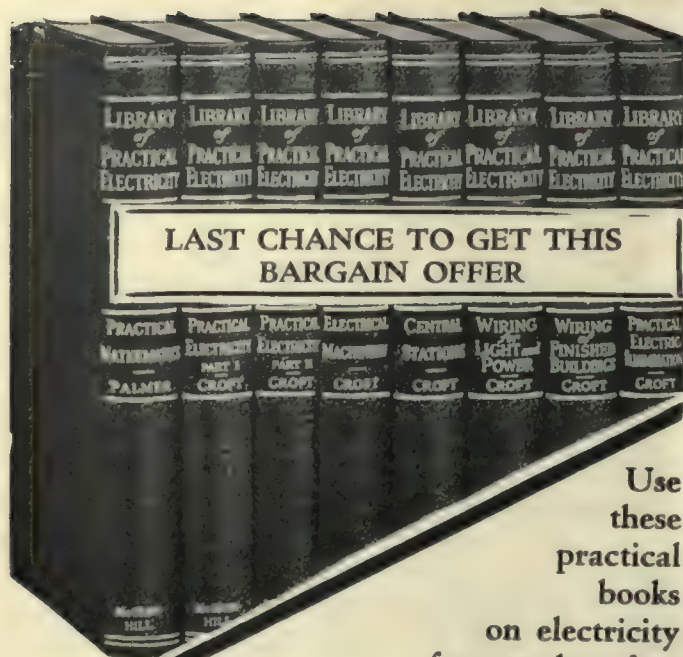
Because the issue is published at a time when the year's requirements are under discussion, the advertising pages form an important part of the Annual Statistical Number's function.

Today when the greatest buying movement in recent years is in immediate prospect, when railway men are welcoming the help that manufacturers can give in furnishing equipment and parts in tune with the new spirit of management and operation; when inventive and engineering skill are being called on for their best efforts; your message should be directed to this most active market through the Annual Statistical Number.

Write or wire your reservation now. Last forms close December 20. Our copy service department will gladly assist in the preparation of suitable copy.

Electric Railway Journal

Tenth Avenue at 36th Street, New York, N. Y.



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for ten days free

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The Croft Library of Practical Electricity

*A combined reference library and home study course
in practical electricity*

Croft tells you the things you need to know about motors, generators, armatures, commutators, transformers, circuits, currents, switchboards, distribution systems—electrical machinery of every type, its installation, operation and repair—wiring for light and power—how to do it mechanically perfect in accordance with the National Electrical Code—wiring of finished buildings—underwriters' and municipal requirements—how to do a complete job, from estimating it, to completion—illumination in its every phase—the latest and most improved methods of lighting—lamps and lighting effects, etc.

Free examination—no money down

Fill in and mail the coupon attached and we will send you the entire set of eight volumes for ten days' Free Examination. We take all the risks—pay all charges. You assume no obligation—you pay nothing unless you decide to keep the books. Then \$1.50 in ten days and the balance at the rate of \$2.00 a month. Send the coupon NOW and see the books for yourself!

When your first payment of \$1.50 is received, we will send you your free copy of Bishop's **ELECTRICAL DRAFTING AND DESIGN**.

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FREE if you subscribe NOW

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McGraw-Hill Book Co., Inc., 370 Seventh Avenue, New York.

Gentlemen:—Please send me the **Croft Library of Practical Electricity** (shipping charges prepaid) for 10 days' free examination. If satisfactory, I will send \$1.50 in ten days and \$2.00 a month until the special price of \$19.50 has been paid. Upon receipt of my first payment of \$1.50 I am to receive a free copy of **Bishop's Electrical Drafting and Design**. If not wanted I will write you for return shipping instructions. (Write plainly and fill in all lines.)

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City and State
Employed by
Occupation E-12-4-26

Where performance counts

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Le Carbone Carbon Brushes

They talk for themselves

W. J. Jeandron

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Canadian Distributors: Lyman Tube & Supply Co., Ltd.
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Micanite Commutator Segments

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Micanite Tubes and Washers

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(Yellow or Black Varnished Tapes)

Empire Oiled Cloths and Papers
(Yellow or Black)

Compounds, Varnishes, Etc.

Send for catalog and helpful booklet on **Commutator
Insulation and Assembly**

MICA INSULATOR COMPANY

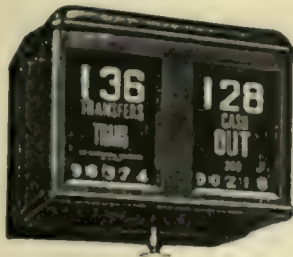
Largest manufacturers in the world of mica insulation.

Established 1893

New York: 68 Church St. Chicago: 542 So. Dearborn St

Cleveland Pittsburgh Cincinnati
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Works: Schenectady, New York; Victoriaville, Canada; London, England



R 11 Double Register

Both our latest single and double registers are now equipped for electric as well as mechanical hand or foot operation.

Full Electric Operation of Fare Registers

A completely satisfactory fare registration system is one that has the confidence of the public, the conductor and the accounting department. The simplicity and accuracy of International Registers maintained for more than thirty years, is combined in the later types with the extra speed and convenience of electric operation.

The International Register Co.
15 South Throop St., Chicago

M-J Armature Babbitt



No less than twenty-five different grades of Babbitt have been successfully perfected in the More-Jones line, designed for various services and at varying prices. "Armature" for electric railways is the recognized standard. *Let us quote you.*

More-Jones Brass & Metal Co.
St. Louis, Mo.

MORE-JONES QUALITY PRODUCTS



EK JUGGA

The India native, when milking the cow, has to have the latter placed ek jugga, which means "like a one-way street."

This is done so that the official watcher may be sure that the milk isn't *stretched*.

The milkman there is notorious for adding adulterants to increase the quantity but decrease the quality of the milk.

So ek jugga is the user's protection—and it's good. But you can't follow that method in having your carbon brushes made.

Therefore, order them from an organization which is known for unvarying high quality of ingredients.

Any of the men below can give you the name of such organization.

Morganite

Brush Co., Inc.

Main Office and Factory
519 West 39th St., New York

DISTRICT ENGINEERS AND AGENTS

Pittsburgh, Electrical Engineering & Mfg. Co., 909 Penn. Ave.
Cincinnati, Electrical Engineering & Mfg. Co., 607 Mercantile Library Building.
Cleveland, Electrical Engineering & Mfg. Co., 422 Union Building.
Baltimore, O. T. Hall, Sales Engineer, 437-A Equitable Building.
Revere, Mass., J. F. Drumme, 75 Pleasant Street.
Los Angeles, Special Service Sales Co., 502 Delta Building.
San Francisco, Special Service Sales Co., 222 Underwood Building, 545 Market Street.
Toronto, Can., Railway & Power Engineering Corp., Ltd., 101 Eastern Ave.
Montreal Can., Railway & Power Engineering Corp., Ltd., 325 Craig St. West.
Winnipeg, Can., Railway & Power Engineering Corp. Ltd., P. O. Box 325.

If he says "they'll go" they'll go ~

If the inspection and testing of the materials and workmanship in the motor busses you buy are in the hands of the P.T.L. Inspectors—you are not only assured of the highest quality throughout but you know that every part is in perfect running order and will give the service you have a right to expect.

P.T.L. Bulletin No. 28 gives all the facts covering this service.

PITTSBURGH TESTING LABORATORY

Inspecting Engineers and Chemists

PITTSBURGH

PENNA.

Branch Offices in the Principal Cities.



88% use "Tool Steel" gears

Questionnaire Replies

THE 1925 A. E. R. A. Equipment Committee sent out a questionnaire on spur and helical gearing. To this questionnaire there were 18 companies replied who controlled a total of 14,910 cars. The lineup of these companies on "Tool Steel" is as follows:

Exclusive Users—9 companies controlling 7943 cars.....	53%	} 88%
Part Users—6 companies controlling 5138 cars.....	35%	
Non-Users—3 companies controlling 1829 cars.....	12%	

As you analyze the 1925 Equipment Committee report on the gear subject bear in mind that the basis information was obtained from companies where 88% of the cars were controlled by those who used "Tool Steel" gears and pinions, either exclusively or regularly.

The Tool Steel Gear &
Pinion Co.,
Cincinnati, Ohio



Kalamazoo Trolley Wheels

The value of Kalamazoo Trolley Wheels and Harps has been demonstrated by large and small electric railway systems for a period of thirty years. Being exclusive manufacturers, with no other lines to maintain, it is through the high quality of our product that we merit the large patronage we now enjoy. With the assurance that you pay no premium for quality we will appreciate your inquiries.



THE STAR BRASS WORKS
KALAMAZOO, MICH., U. S. A.



We make a specialty of
**ELECTRIC RAILWAY
LUBRICATION**

We solicit a test of TULC
on your equipment

The Universal Lubricating Co.

Cleveland, Ohio

Chicago Representatives: Jameson-Ross Company,
Straus Bldg.

The DIFFERENTIAL CAR



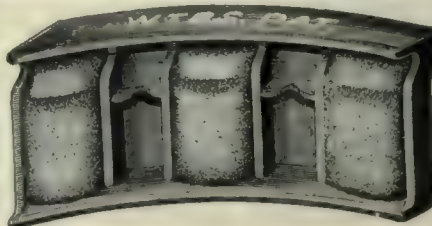
Standard on
60 Railways for

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Differential Crane Car
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THE DIFFERENTIAL STEEL CAR CO., Findlay, O.



Don't
Take
Cars Out
Of Service
To Turn
Worn
Wheels

THE WHEEL TRUING BRAKE SHOE does the work while your car is in service. Don't jeopardize your schedules by excessive pull-ins owing to wheel troubles. Use Wheel Truing Brake Shoes and keep the maximum equipment in service. They save time, labor and money.

WHEEL TRUING BRAKE SHOE CO.
Detroit, Mich.



Complete satisfaction

Operating perfectly and requiring minimum attention for maintenance and lubrication, Earll Catchers and Retrievers give genuinely satisfactory results. Their refinement of design, and mechanical superiority are summarized in the following five features, peculiar to Earll construction.

No-wear Check Pawl
Free-Winding Tension Spring
Ratchet Wind
Emergency Release
Perfect Automatic Lubrication

Earll Catchers and Retrievers
C. I. EARLL, York, Pa.

Canadian Agents:
Railway & Power Engineering Corp., Ltd., Toronto, Ont.
In All Other Foreign Countries:
International General Electric Co., Schenectady, N. Y.

PANTASOTE

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Seat and Curtain Materials
There is no substitute for Pantasote

AGASOTE

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Roofing—Headlining—Wainscoting
The only homogeneous panel board

*standard
for electric railway cars
and motor buses*



Cold Dinners

for *your* passengers?

Not if you use

AJAX

BABBITT for ARMATURES

keeps the rolling stock rolling



The Ajax Metal Company

Established 1880
PHILADELPHIA

NEW YORK CHICAGO BOSTON CLEVELAND

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410 North Michigan Ave.
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Griffin Wheels

with
Chilled Rims
and
Chilled Back of Flanges
For Street and Interurban
Railways

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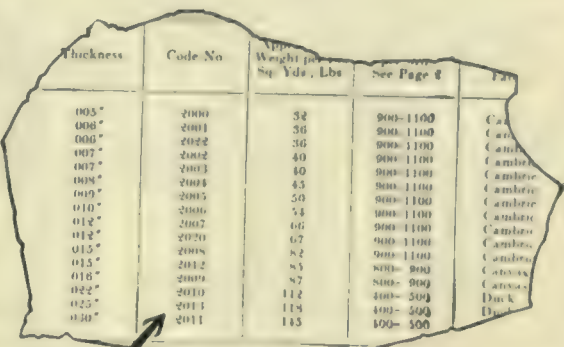
RATE STUDIES FOR PRESENTATION TO PUBLIC SERVICE
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ELECTRIC RAILWAYS

230 South Clark Street, Chicago, Ill.

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THE P. EDWARD WISH SERVICE50 Church St.
NEW YORKStreet Railway Inspection
DETECTIVES131 State St.
BOSTONWhen writing the advertiser for information or
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Journal would be appreciated.**UNA**RAIL BONDS-RAIL JOINTS
DYNAMOTORS
WELDING RODUNA Welding & Bonding Co.
Cleveland, Ohio.*Gets Every Fare*
**PEREY TURNSTILES
or PASSIMETERS**Use them in your Prepayment Areas and
Street CarsPerey Manufacturing Co., Inc.
101 Park Avenue, New York City**BRAZED Rail Bonds ARC WELD**
Portable Arc Welding Outfits
The Electric Railway Improvement Co.
Cleveland, OhioELECTRIC CAR HEATERS
THERMOSTATS BUZZERS
PNEUMATIC DOOR OPERATORS
CONSOLIDATED CAR HEATING CO.


Thickness	Code No.	Weight per Sq. Yds. Lbs.	See Page 2	Label
.005"	2000	32	900-1100	Cambric
.006"	2001	36	900-1100	Cambric
.007"	2002	40	900-1100	Cambric
.008"	2003	44	900-1100	Cambric
.009"	2004	48	900-1100	Cambric
.010"	2005	52	900-1100	Cambric
.012"	2006	60	900-1100	Cambric
.014"	2007	68	900-1100	Cambric
.016"	2008	76	900-1100	Cambric
.018"	2009	84	900-1100	Cambric
.020"	2010	92	900-1100	Cambric
.022"	2011	100	900-1100	Cambric
.024"	2012	108	900-1100	Cambric
.026"	2013	116	900-1100	Cambric
.028"	2014	124	900-1100	Cambric
.030"	2015	132	900-1100	Cambric

What these Code Numbers mean to You in ACTUAL YARDAGE

As varnished insulations are bought by the pound, the gauge governs the yardage. Over in thickness, under in length. Sometimes short measure is not important, but more often it runs into a loss that counts. At any rate, you are not getting what you expect.

Acme Varnished Products are accurate in weave and gauge, and your guide is our Code Number. This Code is always the same. Take Code No. 2000, for instance, as shown above. This number will always bring you Acme black—varnished cambric .005" thick, running 32 pounds per 100 square yards, and having a dielectric strength of 900-1,100 volts per Mil. A similar Code governs every Acme Varnished Product, and we take pride in adhering strictly to it.

May we send you our catalog of Acme Varnished insulations? We are sure you will be interested in our system of "Yardage insurance." Ask for Catalog No. 3J.

ACME WIRE PRODUCTS**The Acme Wire Co.**

Main Office and Plant: New Haven, Conn.

New York, 52 Vanderbilt Ave.
Boston, 80 Federal St.Chicago, 427 West Erie St.
Cleveland, Guardian Bldg.

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Builders since 1868 of
Water Tube Boilers
of continuing reliability

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CINCINNATI, Traction Building
ATLANTA, Candler Building
PHOENIX, ARIZ., Heard Building
DALLAS, TEX., 2001 Magnolia Building
HONOLULU, H. T. Castle & Cooke Building
PORTLAND, ORE., 805 Gasco Building



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Bayonne, N. J.
Barberton, Ohio

Makers of Steam Superheaters
since 1898 and of Chain Grate
Stokers since 1893

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HOUSTON, TEXAS, 1011-13 Electric Building
DENVER, 444 Seventeenth Street
SALT LAKE CITY, 405-6 Kearns Building
SAN FRANCISCO, Sheldon Building
LOS ANGELES, 404-6 Central Building
SEATTLE, L. C. Smith Building
HAVANA, CUBA, Calle de Aguilar 104
SAN JUAN, Porto Rico, Royal Bank Building

Lorain Special Trackwork Girder Rails

Electrically Welded Joints

THE LORAIN STEEL COMPANY

Johnstown, Pa.

Sales Offices:

Atlanta Chicago Cleveland New York
Philadelphia Pittsburgh Dallas
Pacific Coast Representative:
United States Steel Products Company
Los Angeles Portland San Francisco Seattle
Export Representative:
United States Steel Products Company, New York, N. Y.

Wharton Special Trackwork

Trackwork of superior quality,
incorporating the famous
Tisco Manganese Steel.

WM. WHARTON JR. & CO., Inc.

EASTON, PA.

OFFICES:

Boston Chicago El Paso Montreal New York
Philadelphia Pittsburgh San Francisco Scranton

ELRECO TUBULAR POLES



THE "WIRE LOCK" THE CHAMFERED JOINT

COMBINE

Lowest Cost Lightest Weight
Least Maintenance Greatest Adaptability

Catalog complete with engineering data sent on request.

ELECTRIC RAILWAY EQUIPMENT CO.
CINCINNATI, OHIO

New York City, 30 Church Street

R. A. HEGEMAN, Jr., President H. A. HEGEMAN, First Vice-Pres. and Treas.
F. T. SARGENT, Secretary W. C. PETERS, Vice-Pres. Sales and Engineering

National Railway Appliance Co.

Grand Central Terminal, 452 Lexington Ave., Cor. 45th St., New York

BRANCH OFFICES

Munsey Bldg., Washington, D. C. 100 Boylston St., Boston, Mass.
Hegeman-Castle Corporation, Railway Exchange Building, Chicago, Ill.

RAILWAY SUPPLIES

Tool Steel Gears and Pinions Ft. Pitt Spring & Mfg. Co.,
Anglo-American Varnish Co., Springs
Varnishes, Enamels, etc. Flaxlinum Insulation
National Hand Holds Anderson Slack Adjusters
Genesco Paint Oils Economy Electric Devices Co.,
Dunham Hopper Door Device Power Saving and Inspection
Garland Ventilators Meters
Walter Tractor Snow Plows Yellow Coach Mfg. Company—
Feasible Drop Brake Staffs Single and Double-deck Buses

Bethlehem Products for Electric Railways

Tee and Girder Rails; Machine Fitted Joints;
Splice Bars; Hard Center Frogs; Hard Center
Mates; Rolled Alloy Steel Crossings; Abbott and
Center Rib Base Plates; Rolled Steel Wheels and
Forged Axles; Tie Rods; Bolts; Tie Plates and
Pole Line Material.

Catalog Sent on Request

BETHLEHEM STEEL COMPANY, Bethlehem, Pa.

BETHLEHEM



Special Track Work of every
description

THE BUDA COMPANY

Harvey (Suburb Chicago) Illinois

SEARCHLIGHT SECTION

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Positions Wanted, 4 cents a word, minimum 75 cents an insertion, payable in advance.
Positions Vacant and all other classifications, 8 cents a word, minimum charge \$2.00.
Proposals, 40 cents a line an insertion.

INFORMATION:

Ret. Numbers in care of any of our offices count 10 words additional in undisplayed ads.
Discount of 10% if one payment is made in advance for four consecutive insertions of undisplayed ads (not including proposals).

DISPLAYED—RATE PER INCH

1 to 2 inches.....\$1.50 an inch
3 to 4 inches.....4.50 an inch
5 to 6 inches.....4.10 an inch
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Rates for larger spaces, or yearly rates, on request.
In advertising work is measured vertically on one column, 3 columns—30 inches—to a page.

POSITIONS VACANT

WORKING foreman to take charge of electrical shop in New York City. P-954, Electric Railway Journal, Tenth Ave. at 36th St., New York.

POSITIONS WANTED

OPERATING and maintenance executive, fifteen years' practical experience in all branches of electric railway and motor bus transportation; broad experience in schedule making, public, labor problems and requirements for successful and efficient operation of both; University graduate; A-1 references. PW-947, Electric Railway Journal, Guardian Bldg., Cleveland, Ohio.

SUPERINTENDENT of transportation available, broad experience and fine record of achievements on large properties in East and Central West. Recognized as operating official of exceptional ability, successful in public relations, rehabilitation of properties, skilled in handling labor; capable taking over any property and getting results under any condition. High-class references. Correspondence invited and treated confidential. Willing to locate anywhere. PW-949, Electric Railway Journal, Guardian Bldg., Cleveland, Ohio.

SALESMAN AVAILABLE

ELECTRICAL engineer: Graduate electrical engineer, experienced in design and manufacture of railway signaling apparatus, two years public utility work. Open for sales engineering position with electric railway supply house. SA-951, Electric Railway Journal, 1600 Arch Street, Philadelphia, Pa.

OFFICIAL PROPOSAL

Bids: Dec. 15.

Car Advertising Space

Honolulu, Hawaii.

Sealed proposals for the leasing of car advertising space in the street cars and buses operated by the Honolulu Rapid Transit Co., Ltd., of Honolulu, Hawaii, will be received at their office, 1133 Alapai Street, Honolulu, T.H., up to 12 o'clock noon, Wednesday, Dec. 15, 1926.

Specifications as to bids may be obtained from the office of the Company, the Electric Railway Journal or Electric Traction.

The company reserves the right to reject any or all bids.

WANTED

Electric Locomotive

for interurban work. 600 volt. Furnish full description and state price.

W-953, Electric Railway Journal
7 So. Dearborn St., Chicago, Ill.

We Buy

Abandoned Railways

WE are in a position to purchase outright abandoned railways in their entirety and are well equipped to do our own dismantling.

To enable us to submit our best proposition, please send complete list of rolling stock, rail, overhead wires, materials and supplies.

What have you to offer?

H. E. SALZBERG CO., Inc.

50 CHURCH ST., NEW YORK CITY

COMPRESSORS

- 2—General Electric CP-21.
- 10—General Electric CP-27.
- 4—General Electric CP-28.
- 8—Westinghouse DH-16.
- 1—Westinghouse DH-10.

IRVING S. VAN LOAN CORPORATION

1750 Broadway, New York City
Specialists in street cars or any part of a street car.
Illustrated bulletin supplied on request.

FOR SALE

1—Snow Sweeper

Built by McGuire
Fine condition. Low price.
Immediate Delivery
ELECTRIC EQUIPMENT CO.
Commonwealth Bldg., Phila., Pa.

An Opportunity to Equip your line with Safeway Coaches, Six Wheel

FACTORY DEMONSTRATORS FOR SALE

CITY TYPE—We have on hand for immediate delivery a few city type busses, slightly used for demonstrating purposes by our own drivers.

INTERCITY TYPE—These demonstrators are of 29 and 33 passenger capacity. Some with Parlor Car and De Luxe bodies. All in first-class condition.

These busses will be sold at cost for quick purchase, with customary guarantees, painted in your own colors.

THE SIX WHEEL COMPANY

1800 W. Lehigh Ave., Philadelphia, Pa.

WHAT AND WHERE TO BUY

Equipment, Apparatus and Supplies Used by the Electric Railway Industry
with Names of Manufacturers and Distributors Advertising in this Issue

Advertising, Street Car

Collier, Inc., Barron G.

Air Brakes

Westinghouse Air Brake Co.

Air Receivers and After-coolers

Ingersoll-Rand Co.

Anchors, Guy

Elec. Service Supplies Co.
Ohio Brass Co.
Westinghouse E. & M. Co.

Appraisals

American Appraisal Co.

Armature Shop Tools

Elec. Service Supplies Co.

Automatic Regulators, Voltage, Current & Synchronizers

American Brown Boveri Corp.

Automatic Return Switch

Stands
Ramapo Ajax Corp.

Automatic Safety Switch

Stands
Ramapo Ajax Corp.

Axles

Bemis Car Truck Co.
Bethlehem Steel Co.
Brill Co., The J. G.
Cincinnati Car Co.
National Ry. Appliance Co.
St. Louis Car Co.
Westinghouse E. & M. Co.

Axles, Steel

Carnegie Steel Co.

Babbitt Metal

Ajax Metal Co.
More-Jones Brass & Metal Co.

Badges and Buttons

Elec. Service Supplies Co.
International Register Co.

Bearings and Bearing Metals

Ajax Metal Co.
Bemis Car Truck Co.
Brill Co., The J. G.
General Electric Co.
More-Jones Brass & Metal Co.
St. Louis Car Co.
Westinghouse E. & M. Co.

Bearings, Center and Roller

Slide
Stucki Co., A.

Bells and Buzzers

Consolidated Car Heating Co.

Bells and Gongs

Brill Co., The J. G.
Elec. Service Supplies Co.
St. Louis Car Co.

Benders, Rail

Railway Track-work Co.

Bodies, Bus

Brill Co., The J. G.
Cummings Car & Coach Co.
Inc.

Body Material, Haskellite and Plymetil

Haskellite Mfg. Corp.

Boilers

Babcock & Wilcox Co.

Boiler Tubes

National Tube Co.

Bond Testers

American Steel & Wire Co.
Electric Service Supplies Co.

Bonding Apparatus

Amer. Steel & Wire Co.
Electric Railway Improvement Co.
Elec. Service Supplies Co.
Ohio Brass Co.
Railway Track-work Co.
Una Welding & Bonding Co.

Bonds, Rail

Amer. Steel & Wire Co.
Electric Railway Improvement Co.
Elec. Service Supplies Co.
General Electric Co.
Ohio Brass Co.
Railway Track-work Co.
Una Welding & Bonding Co.
Westinghouse E. & M. Co.

Book Publishers

McGraw-Hill Book Co., Inc.

Brackets and Cross Arms

(See also Poles, Ties, Posts, Etc.)
Bates Expanded Steel Truss Co.
Elec. Ry. Equipment Co.
Elec. Service Supplies Co.
Hubbard & Co.
Ohio Brass Co.

Brake Adjusters

Brill Co., The J. G.
National Ry. Appliance Co.
Westinghouse Tr. Br. Co.

Brake Shoes

American Brake Shoe & Foundry Co.
Bemis Car Truck Co.
Brill Co., The J. G.
St. Louis Car Co.
Wheel Truing Brake Shoe Co.

Brakes, Brake Systems and Brake Parts

Bemis Car Truck Co.
Brill Co., The J. G.
General Electric Co.
National Brake Co.
Safety Car Devices Co.
St. Louis Car Co.
Westinghouse Tr. Br. Co.

Brushes, Carbon

General Electric Co.
Jeandron, W. J.
Le Carbone Co.
Morganite Brush Co., Inc.
Westinghouse E. & M. Co.

Brushes, Graphite

Morganite Brush Co., Inc.

Brushes, Wire Pneumatic

Ingersoll-Rand Co.

Buildings

Haskellite Mfg. Corp.

Buses, Motor

Brill Co., The J. G.
Cummings Car Coach Co.
Graham Bros.
St. Louis Car Co.
White Co.

Bushings, Case Hardened and Manganese

Brill Co., The J. G.
Bemis Car Truck Co.
St. Louis Car Co.

Cables. (See Wires and Cables)

Cambrie Tapes, Yellow and Black Varnish

Irrington Varnish & Ins. Co.

Cambrie Yellow and Black Varnish

Mica Insulator Co.

Carbon Brushes (See Brushes, Carbon)

Car Lighting Fixtures

Elec. Service Supplies Co.

Car Panel Safety Switches

Consolidated Car Heat Co.
Westinghouse E. & M. Co.

Car Wheels, Rolled Steel

Bethlehem Steel Co.

Cars, Dump

Brill Co., The J. G.
Differential Steel Car Co.
Inc.

Cars, Gas-Electric

Brill Co., The J. G.
General Electric Co.
Westinghouse E. & M. Co.

Cars, Gas, Rail

Brill Co., The J. G.
St. Louis Car Co.

Cars, Passenger, Freight, Express, etc.

Amer. Car Co.
Brill Co., The J. G.
Cincinnati Car Co.
Cummings Car & Coach Co.
Kuhlman Car Co., G. C.
National Ry. Appliance Co.
St. Louis Car Co.
Wason Mfg. Co.

Cars, Second Hand

Electric Equipment Co.

Cars, Self-Propelled

Brill Co., The J. G.
General Electric Co.

Castings, Brass Composition or Copper

Ajax Metal Co.
More-Jones Brass & Metal Co.

Castings, Gray Iron and Steel

American Steel Foundries
Bemis Car Truck Co.
St. Louis Car Co.

Castings, Malleable & Brass

Bemis Car Truck Co.
St. Louis Car Co.

Catchers and Retrievers, Trolley

Earl, C. I.
Elec. Service Supplies Co.

Ohio Brass Co.

Wood Co., Chas. N.

Catenary Construction

Archbold-Brady Co.

Ceiling Car

Haskellite Mfg. Corp.

Ceilings, Plywood, Panels

Haskellite Mfg. Corp.

Cement

N. Amer. Cement Corp.

Cement Accelerator

N. Amer. Cement Corp.

Change Carriers

Cleveland Fare Box Co.
Electric Service Supplies Co.

Circuit-Breakers

General Electric Co.
Westinghouse E. & M. Co.

Circuit Breakers, Oil

American Brown Boveri Corp.

Clamps and Connectors for Wires and Cables

Elec. Ry. Equipment Co.
Elec. Ry. Improvement Co.
Elec. Service Supplies Co.
General Electric Co.
Hubbard & Co.
Ohio Brass Co.
Westinghouse E. & M. Co.

Cleaners and Scrapers, Track

(See also Snow-Plows, Sweepers and Brooms)

Brill Co., The J. G.
Cincinnati Car Co.
Ohio Brass Co.
St. Louis Car Co.

Clusters and Sockets

General Electric Co.

Coal and Ash Handling (See Conveying and Hoisting Machinery)

Coil Banding and Winding

Machines
Elec. Service Supplies Co.
Westinghouse Elec. & M. Co.

Coils, Armature and Field

General Electric Co.
Westinghouse E. & M. Co.

Coils, Choke and Kicking

Elec. Service Supplies Co.
General Electric Co.
Westinghouse E. & M. Co.

Coin Counting Machines

Cleveland Fare Box Co.
International Register Co.

Coin Sorting Machines

Cleveland Fare Box Co.

Coin Wrappers

Cleveland Fare Box Co.

Commutator Slotters

Elec. Service Supplies Co.
General Electric Co.
Westinghouse E. & M. Co.
Wood Co., Chas. N.

Commutator Truing Devices

General Electric Co.

Commutators or Parts

Cameron Electrical Mfg. Co.
General Electric Co.
Westinghouse E. & M. Co.

Compressors, Air

General Electric Co.
Ingersoll-Rand Co.
Westinghouse Tr. Br. Co.

Compressors, Air, Portable

Ingersoll-Rand Co.

Condensers

General Electric Co.
Ingersoll-Rand Co.
Westinghouse E. & M. Co.

Condenser Papers

Irrington Varnish & Ins. Co.

Connectors, Solderless

Westinghouse E. & M. Co.

Connectors, Trailer Car

Consolidated Car Heat Co.
Elec. Service Supplies Co.
Ohio Brass Co.

Controllers or Parts

General Electric Co.
Westinghouse E. & M. Co.

Controller Regulators

Elec. Service Supplies Co.

Controlling Systems

General Electric Co.
Westinghouse E. & M. Co.

Converters, Rotary

General Electric Co.
Westinghouse E. & M. Co.

Copper Wire

American Brass Co.
American Steel & Wire Co.
Anaconda Copper Mining Co.

Copper Wire Instruments, Measuring, Testing and Recording

American Brass Co., The
American Steel & Wire Co.
Anaconda Copper Mining Co.

Cord, Bell, Trolley, Register, etc.

American Steel & Wire Co.
Brill Co., The J. G.
Elec. Service Supplies Co.
International Register Co.
Roebbing's Sons Co., John A.
Samson Cordage Works
Silver Lake Co.

Cord Connectors and Couplers

Elec. Service Supplies Co.
Samson Cordage Works
St. Louis Car Co.
Wood Co., Chas. N.

Couplers, Car

American Steel Foundries
Brill Co., The J. G.
Cincinnati Car Co.
Ohio Brass Co.
St. Louis Car Co.
Westinghouse Tr. Br. Co.

Cranes, Hoists & Lifts

Buda Co., The
Electric Service Supplies Co.

Cross Arms (See Brackets)

Crossings

Ramapo Ajax Corp.
Wm. Wharton, Jr. & Co.

Crossing Foundations

International Steel Tie Co.

Crossings, Frog and Switch

Ramapo Ajax Corp.
Wm. Wharton, Jr. & Co.

Crossings, Manganese

Bethlehem Steel Co.
Ramapo Ajax Corp.
Wm. Wharton, Jr. & Co.

Crossing Signals. (See Signal Systems, Highway Crossing)

Crossings, Track (See Track, Special Work)

Crossings, Trolley

Ohio Brass Co.
Westinghouse E. & M. Co.

Curtains & Curtain Fixtures

Brill Co., The J. G.
O. M. Edwards Co., Inc.
Pantastote Co., Inc.
St. Louis Car Co.

Dealer's Machinery & Second Hand Equipment

Elec. Equipment Co.
Salzberg, Inc., H. E.
Van Loan Corp., Irving S.

Derailing Switches

Ramapo Ajax Corp.

Destination Signs

Elec. Service Supplies Co.

Detective Service

Wish Service, Edward P.

Door Operating Devices

Brill Co., The J. G.
Consolidated Car Heat Co.
National Pneumatic Co.
Safety Car Devices Co.

Doors & Door Fixtures

Brill Co., The J. G.
O. M. Edwards Co., Inc.
General Electric Co.
Hale-Kilburn Co.
St. Louis Car Co.

Doors, Folding Vestibule

National Pneumatic Co.
Safety Car Devices Co.

Drills, Track

Amer. Steel & Wire Co.
Elec. Service Supplies Co.
Ingersoll-Rand Co.
Ohio Brass Co.

Dryers, Sand

Elec. Service Supplies Co.
Ohio Brass Co.
Westinghouse Elec. & Mfg. Co.

Ears

Elec. Service Supplies Co.
Ohio Brass Co.
Westinghouse E. & M. Co.

Electric Grinders

Railway Track-work Co.

Electrical Wires and Cables

Amer. Electrical Works
Amer. Steel & Wire Co.
John A. Roebbing's Sons Co.

Electrodes, Carbon

Railway Track-work Co.
Una Welding & Bonding Co.

Electrodes, Steel

Railway Track-work Co.
Una Welding & Bonding Co.

Engineers, Consulting, Contracting and Operating

Archbold-Brady Co.
Beeler, John A.
J. Rowland Bibbins
F. J. Brennan
Buchanan Laying Corp.
Day & Zimmermann, Inc.
A. L. Drum & Co.
Ford, Bacon & Davis
Hemphill & Wells
Holst, Engelhardt W.
Jackson, Walter
Kelker & DeLeuw
Kelly-Cooke Co.
McClellan & Junkersfeld
Richey, Albert S.
Sanderson & Porter
Stevens & Wood
Stone & Webster
White Eng. Corp., The J. G.

Engineers, Inspecting & Chemists

Pittsburgh Testing Laboratory

Engines, Gas, Oil and Steam

Ingersoll-Rand Co.
Westinghouse E. & M. Co.

Engines, Gasoline

Continental Motors Co.

Exterior Side Panels

Haskellite Mfg. Corp.

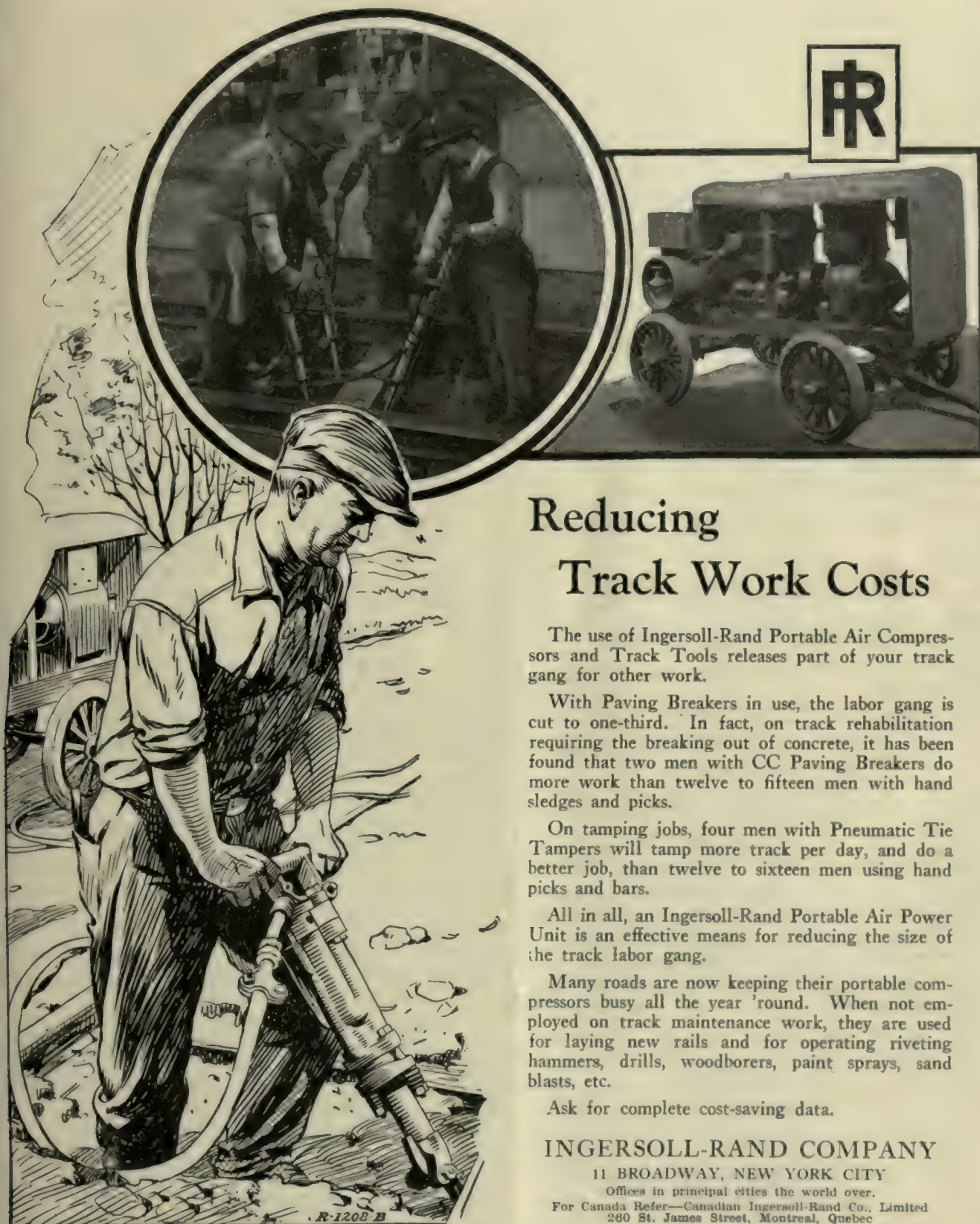
Fare Boxes

Cleveland Fare Box Co.
Nat'l Ry. Appliance Co.
Perey Mfg. Co.

Fare Registers

Elec. Service Supplies Co.

Fences, Woven Wire and Fence Posts



The illustration depicts a worker in a cap and overalls using a large pneumatic tool, likely a tamping machine, on a track. A circular inset in the upper left shows a group of workers in a trench, and a rectangular inset in the upper right shows a portable air compressor. The Ingersoll-Rand logo, a stylized 'R' inside a square, is positioned above the rectangular inset.

Reducing Track Work Costs

The use of Ingersoll-Rand Portable Air Compressors and Track Tools releases part of your track gang for other work.

With Paving Breakers in use, the labor gang is cut to one-third. In fact, on track rehabilitation requiring the breaking out of concrete, it has been found that two men with CC Paving Breakers do more work than twelve to fifteen men with hand sledges and picks.

On tamping jobs, four men with Pneumatic Tie Tampers will tamp more track per day, and do a better job, than twelve to sixteen men using hand picks and bars.

All in all, an Ingersoll-Rand Portable Air Power Unit is an effective means for reducing the size of the track labor gang.

Many roads are now keeping their portable compressors busy all the year 'round. When not employed on track maintenance work, they are used for laying new rails and for operating riveting hammers, drills, woodborers, paint sprays, sand blasts, etc.

Ask for complete cost-saving data.

INGERSOLL-RAND COMPANY
 11 BROADWAY, NEW YORK CITY
 Offices in principal cities the world over.
 For Canada Refer—Canadian Ingersoll-Rand Co., Limited
 260 St. James Street, Montreal, Quebec

R-120B B

Ingersoll-Rand

04-P

- Gear Cases**
Chillingworth Mfg. Co.
Elec. Service Supplies Co.
Westinghouse E. & M. Co.
- Gears and Pinions**
Bemis Car Truck Co.
Elec. Service Supplies Co.
General Electric Co.
Nat'l Ry. Appliance Co.
Tool Steel Gear & Pinion Co.
- Generating Sets, Gas-Electric**
General Electric Co.
- Generators**
American Brown Boveri Corp.
General Electric Co.
Westinghouse E. & M. Co.
- Grinder Rails**
Bethlehem Steel Co.
Lorain Steel Co.
- Gongs (See Bells and Gongs)**
- Greases (See Lubricants)**
- Grinders & Grinding Supplies**
Metal & Thermit Corp.
Railway Track-work Co.
- Grinders, Portable**
Railway Track-work Co.
- Grinders, Portable Electric**
Railway Track-work Co.
- Grinding Bricks and Wheels**
Railway Track-work Co.
- Guard Rail Clamps**
Ramapo Ajax Corp.
- Guard Rails, Tee Rail & Manganoese**
Ramapo Ajax Corp.
Wm. Wharton, Jr. & Co.
- Guards, Trolley**
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Ohio Brass Co.
- Hammers, Pneumatic**
Ingersoll-Rand Co.
- Harps, Trolley**
Elec. Service Supplies Co.
More-Jones Brass & Metal Co.
Star Brass Works
- Headlights**
Elec. Service Supplies Co.
General Electric Co.
Ohio Brass Co.
St. Louis Car Co.
- Headlining**
Haskelite Mfg. Corp.
Pantasote Co., Inc.
- Heaters, Car (Electric)**
Consolidated Car Heat. Co.
Gold Car Heat. & Ltg. Co.
Nat'l Ry. Appliance Co.
Smith Heater Co., Peter
- Heaters, Car, Hot Air and Water**
Smith Heater Co., Peter
- Heaters, Car, Stove**
Smith Heater Co., Peter
- Helmets, Welding**
Railway Track-work Co.
Una Welding & Bonding Co.
- Holsts, Portable**
Ingersoll-Rand Co.
- Hose, Bridges**
Ohio Brass Co.
- Hose, Pneumatic**
Westinghouse Tr. Br. Co.
- Inspecting Engineers & Chemists**
Pittsburgh Testing Laboratory
- Instruments, Measuring, Testing and Recording**
American Steel & Wire Co.
General Electric Co.
Westinghouse E. & M. Co.
- Insulating Cloth, Paper and Tape**
General Electric Co.
Irvington Varnish & Ins. Co.
Mica Insulator Co.
Okonite Co.
Okonite-Callender Cable Co. Inc.
U. S. Rubber Co.
Westinghouse E. & M. Co.
- Insulating Machinery**
Amer. Ins. Machinery Co.
- Insulating Silk**
Irvington Varnish & Ins. Co.
- Insulating Varnishes**
Irvington Varnish and Insulating Co.
- Insulation (See also Paints)**
Electric Ry. Equipment Co.
Elec. Service Supplies Co.
General Electric Co.
Irvington Varnish & Ins. Co.
Mica Insulator Co.
Okonite Co.
Okonite-Callender Cable Co. Inc.
U. S. Rubber Co.
Westinghouse E. & M. Co.
- Insulation Slot**
Irvington Varnish & Ins. Co.
- Insulator Pins**
Elec. Service Supplies Co.
Hubbard & Co.
- Insulators (See also Line Materials)**
Electric Ry. Equipment Co.
Elec. Service Supplies Co.
General Electric Co.
Irvington Varnish & Ins. Co.
Ohio Brass Co.
Westinghouse E. & M. Co.
- Interior Side Linings**
Haskelite Mfg. Corp.
- Interurban Cars**
(See Cars, Passenger, Freight, Express, etc.)
- Jacks (See also Hoists and Lifts)**
Buda Co., The
Elec. Service Supplies Co.
National Ry. Appliance Co.
- Journal Boxes**
Bemis Car Truck Co.
Brill Co., The J. G.
St. Louis Car Co.
- Lamps, Guards and Fixtures**
Elec. Service Supplies Co.
General Electric Co.
Westinghouse E. & M. Co.
- Lamps, Arc and Incandescent (See also Headlights)**
General Electric Co.
Westinghouse E. & M. Co.
- Lamps, Signal and Marker**
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Ohio Brass Co.
- Leather**
Cleveland Tanning Co.
- Letter Boards**
Haskelite Mfg. Corp.
- Lightning Protection**
Elec. Service Supplies Co.
General Electric Co.
Ohio Brass Co.
Westinghouse E. & M. Co.
- Line Material (See also Brackets, Insulators, Wires, etc.)**
Archbold-Brady Co.
Electric Ry. Equipment Co.
Elec. Service Supplies Co.
General Electric Co.
Hubbard & Co.
More-Jones Brass & Metal Co.
Ohio Brass Co.
Westinghouse E. & M. Co.
- Locking Spring Boxes**
Wm. Wharton, Jr. & Co.
- Locomotives, Diesel, Electric**
American Brown Boveri Corp.
- Locomotives, Electric**
American Brown Boveri Corp.
Cummings Car & Coach Co.
General Electric Co.
St. Louis Car Co.
Westinghouse E. & M. Co.
- Locomotives, Oil Engine, Electric, Diesel**
Ingersoll-Rand Co.
- Lubricating Engineers**
Texas Company
Universal Lubricating Co.
- Lubricants, Oil and Grease**
Texas Company
Universal Lubricating Co.
- Lumber (See Poles, Ties, etc.)**
- Machinery, Insulating**
American Insulating Machinery Co.
- Manganoese Parts**
Bemis Car Truck Co.
- Manganoese Steel Guard Rails**
Ramapo Ajax Corp.
Wm. Wharton, Jr. & Co.
- Manganoese Steel, Special Track Work**
Bethlehem Steel Co.
Wm. Wharton, Jr. & Co.
- Manganoese Steel Switches, Frogs & Crossings**
Bethlehem Steel Co.
Ramapo Ajax Corp.
Wm. Wharton, Jr. & Co.
- Mica**
Mica Insulator Co.
- Motor and Generator Sets**
General Electric Co.
- Motor Buses (See Buses, Motor)**
- Motor Generator Sets**
American Brown Boveri Corp.
- Motorman's Seats**
Brill Co., The J. G.
Elec. Service Supplies Co.
St. Louis Car Co.
Wood Co., Chas. N.
- Motors, Electric**
General Electric Co.
Westinghouse E. & M. Co.
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Bemis Car Truck Co.
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Dixon Crucible Co., Joseph
Electric Service Supplies Co.
Irvington Varnish & Ins. Co.
- Paints and Varnishes for Woodwork**
National Ry. Appliance Co.
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Haskelite Mfg. Corp.
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ALPHABETICAL INDEX TO ADVERTISEMENTS

A	Page	B	Page	J	Page	R	Page
Acme Wire Co., The.....	47	Day & Zimmermann, Inc.....	46	Jackson, Walter.....	46	Railway Track-work Co.....	4
Ajax Metal Co., The.....	45	Dayton Mechanical Tie Co., The.....	46	Jeandron, W. J.....	42	Railway Utility Co.....	53
American Appraisal Co., The.....	22	Insert 11-12				Ramapo Ajax Co.....	55
American Brass Co., The.....	55	Differential Steel Car Co., The..	44			Richey, Albert S.....	46
American Brown Boveri Elec. Corp.....	14-15	Drum & Co., A. L.....	47			Roebbling's Sons Co., John A.....	53
American Car Co.....	57			K			
American Electrical Works.....	53			Kelker, DeLeuw & Co.....	46	S	
American Insulating Machinery Co.....	53			Kelly, Cooke & Co.....	46	St. Louis Car Co.....	31
American Steel & Wire Co.....	36			Kulhman Car Co.....	57	Safety Car Devices.....	10
American Steel Foundries.....	6					Salzberg Inc., H. E.....	49
Anaconda Copper Mining Co.....	55					Samson Cordage Works.....	53
Archbold-Brady Co.....	46					Sanderson & Porter.....	46
Asso. of Mfrs. of Chilled Car Wheels.....	32					Searchlight Section.....	49
						Silver Lake Co.....	55
						Six-Wheel Co., The.....	49
						Smith Heater Co., Peter.....	55
						Star Brass Works, The.....	44
						Stevens & Wood, Inc.....	46
						Stone & Webster.....	48
						Stucki Co., A.....	55
						T	
						Texas Company, The.....	34
						Tool Steel Gear & Pinion Co., The.....	44
						U	
						Una Welding & Bonding Co....	47
						Union Switch & Signal Co.....	16
						Universal Lubricating Co., The..	44
						V	
						Van Loan Corp., Irving S.....	49
						W	
						"Want" Ads.....	49
						Wason Mfg. Co.....	57
						Westinghouse Elec. & Mfg. Co. 2	
						Westinghouse Traction Brake Co. 17	
						Wharton, Wm., Jr. & Co., Inc. 48	
						"What and Where to Buy,"	50, 52, 54
						Wheel Truing Brake Shoe Co.. 44	
						White Co., The.....	23
						White Eng. Corp., The J. G.....	46
						Wish Service, The P. Edw.....	47
						Wood Co., Chas. N.....	53

WHAT AND WHERE TO BUY

(Continued from page 52)

Ticket Choppers and Destroyers Elec. Service Supplies Co.	Trolley Bases General Electric Co. More-Jones Brass & Metal Co. National Ry. Appliance Co. Ohio Brass Co.	Trucks, Motor White Co.	Metal & Thermit Corp. Ohio Brass Co. Railway Trackwork Co. Una Welding & Bonding Co.	Bemis Car Truck Co. Carnegie Steel Co.
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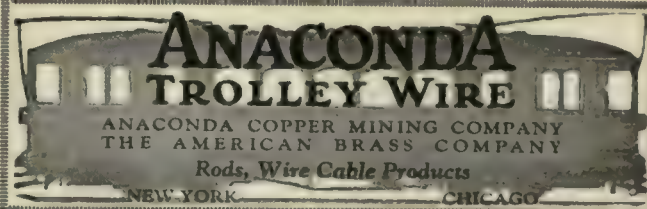
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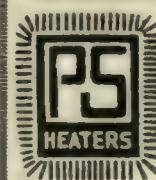
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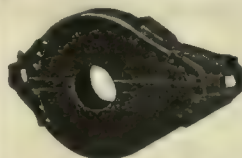
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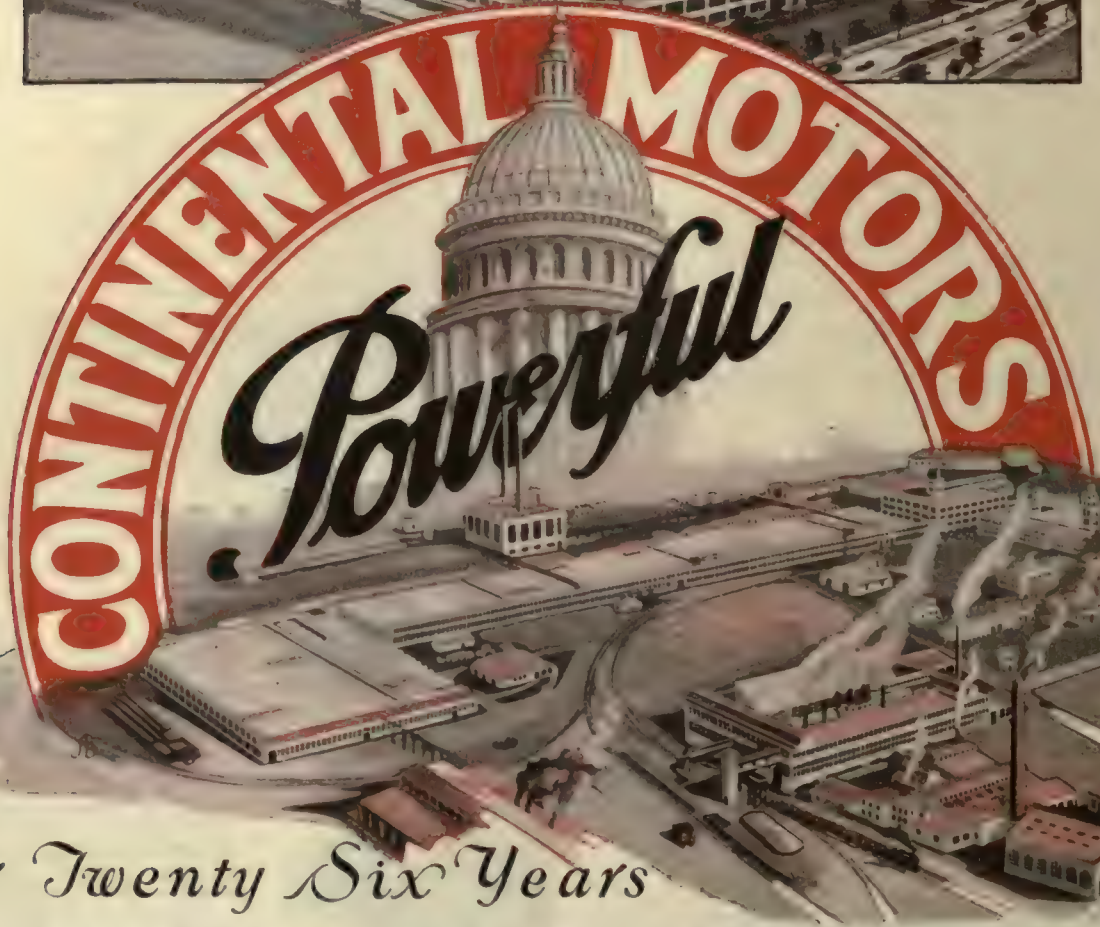
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	Actual Operating Costs Per Car Mile	
	Old Cars	New Cars
Way and Structures.....	4.92	4.24
Maintenance of Equipment.....	5.24	3.18
Power	5.84	4.72
Conducting Transportation.....	8.53	6.94
Traffic
General and Misc.....	3.47	4.14
Total	23.00	23.22

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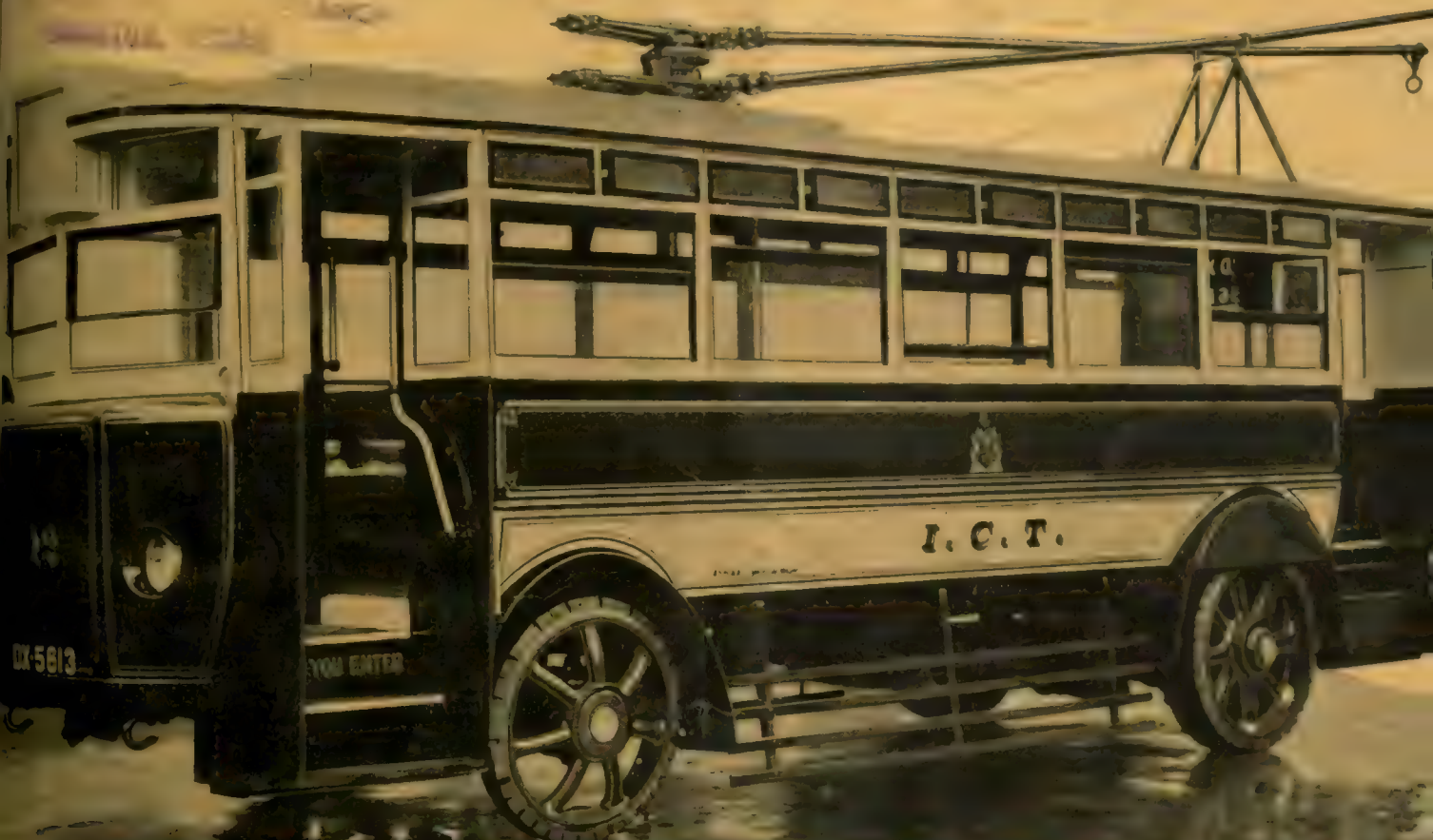


In spite of the long period of service, these two G-E Locomotives will continue in operation assisted by the new 80-ton locomotive recently delivered. Records such as this have earned for G-E locomotives their reputation for dependability.

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Everywhere, for every transportation purpose on streets, rails or highways, Timken Bearings are known as a positive means of improving performance and reducing operating costs.  Timken Bearings are equally valuable resisting the shock and thrust of steel wheels on steel curves, or providing the surety, smoothness and quiet which attract passengers. With endurance multiplied and friction vanquished Timken-equipped units cost less per passenger car mile.

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Twelve More Modern Cars for Scranton

LESS than a year ago when ten new modern Westinghouse-equipped cars were placed in service in Scranton, they were expected to reduce operating costs, increase patronage and build public good-will.

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1926

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Vol. 68
No. 24

CONTENTS

Pages
1033-1076

DECEMBER 11, 1926

Editorials	1033
Co-ordinated Transportation Proposed for St. Louis	1036
Municipal committee declares mass transportation must continue to be provided by electric cars supplemented by motor buses and rapid transit lines. Surface car subways recommended for down- town area, designed so as to be capable of rapid transit use later.	
Railway Takes Tolls from Automobilists.....	1042
Paving Burden Shifted by Changing the Type of Transportation	1043
Substitution of trackless trolley operation in place of tramway service in British industrial town reduced way maintenance cost, but other expenses were increased and first year showed large deficit.	
Benefits of Eight-Car Train Seen in Loop.....	1045
80 Per Cent of Detroit Shoppers Use Public Transportation	1045
Free Parking Spaces Increase Street Car Riding..	1046
Many motorists avoid congested traffic during fair week by park- ing their cars and using electric cars of the Grand Rapids Rail- way to reach the fair grounds.	
"La Passe Hebdomadaire"	1047
BY WALTER JACKSON. Success with one-zone weekly pass on Levis Tramways leads to two-zone pass with harder-to-buy ticket rate. French-Canadian population has been induced to ride by many appeals to the ideals of thrift.	
"Trolley Bargain Day" in Toledo	1049
Co-operation with railway and merchandising officials on store's anniversary results in profits for both. Checks show trolley way the best way.	
Baltimore Studies Power Consumption of Cars..	1050
Oscillation tests help to determine power taken in car operation and result in improved methods of lubrication.	
Pooling of London Passenger Transport Facilities Proposed	1051
London and home counties advisory committee, in two reports, suggests working agreement between all local passenger transport facilities, including rapid transit railways, electrified railroads, tramways and motor buses.	
The Readers' Forum	1053
Maintenance Notes	1054
Association News and Discussion	1057
American Association News	1059
News of the Industry	1062
Recent Bus Developments	1068
Financial and Corporate	1069
Personal Mention	1072
Manufactures and the Markets	1075

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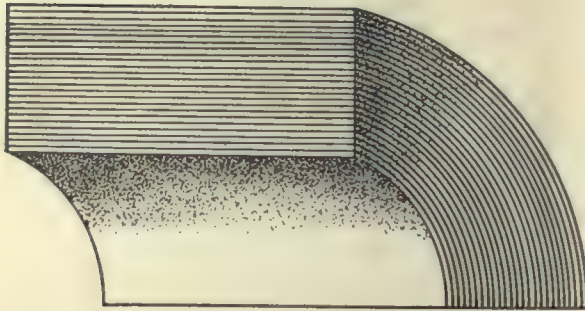
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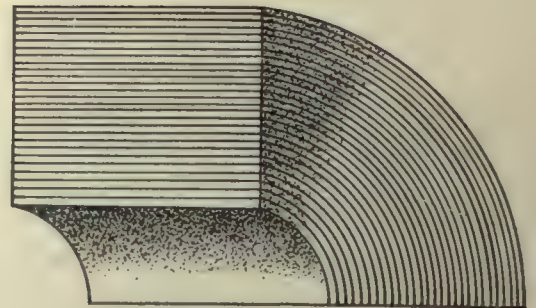
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CL Carbon Breaker Brushes Are Wide and Shallow



Average Proportion of CL Brush Contact Surfaces



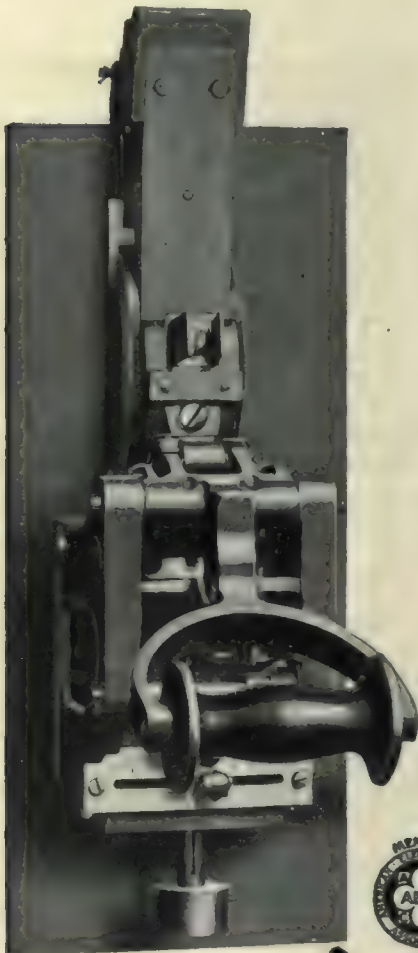
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Because:

1. THESE proportions afford greater radiating surface with the same cross section of copper. The sketches above have the same area but the CL brush has approximately twice the radiating surface.
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3. Shallow brushes allow for more uniform current distribution since there is less difference in length between the outside laminations. With the cross section of all laminations equal, the length determines the relative resistance and resultant distribution of current.

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East Pittsburgh Pennsylvania

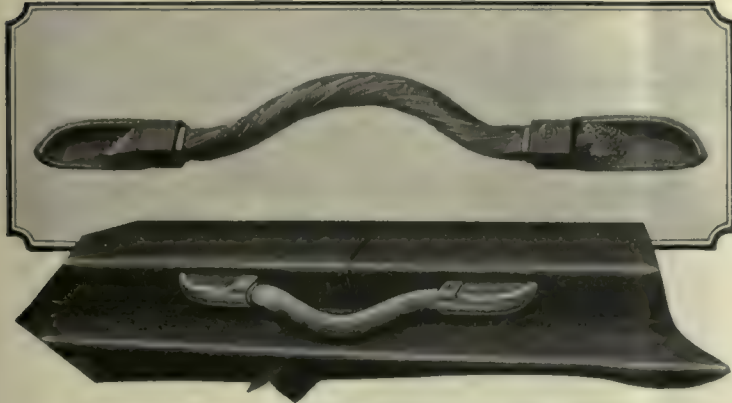
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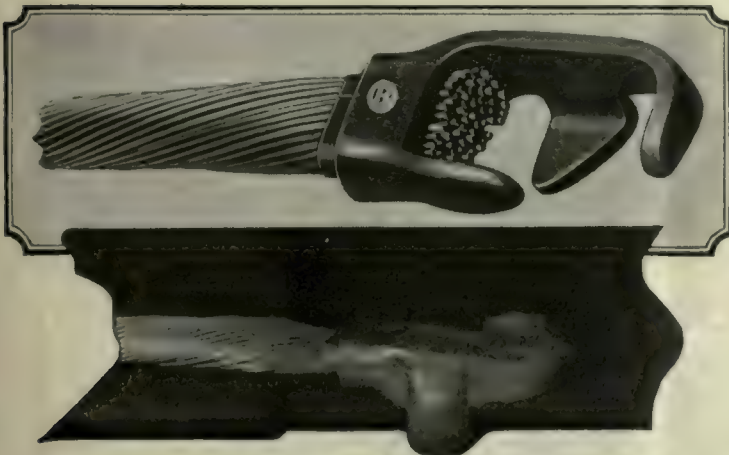
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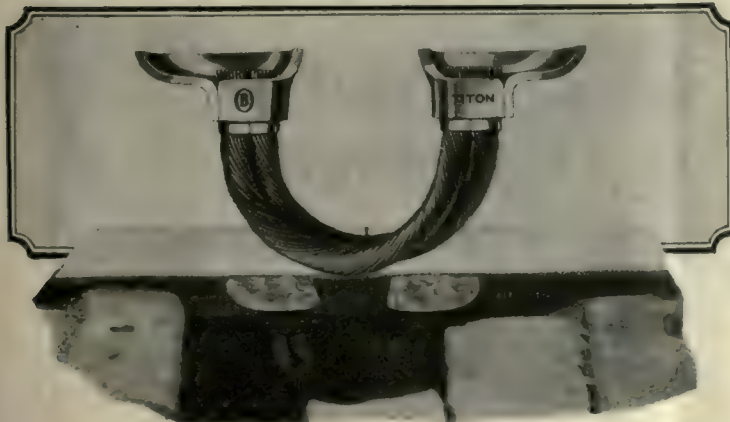


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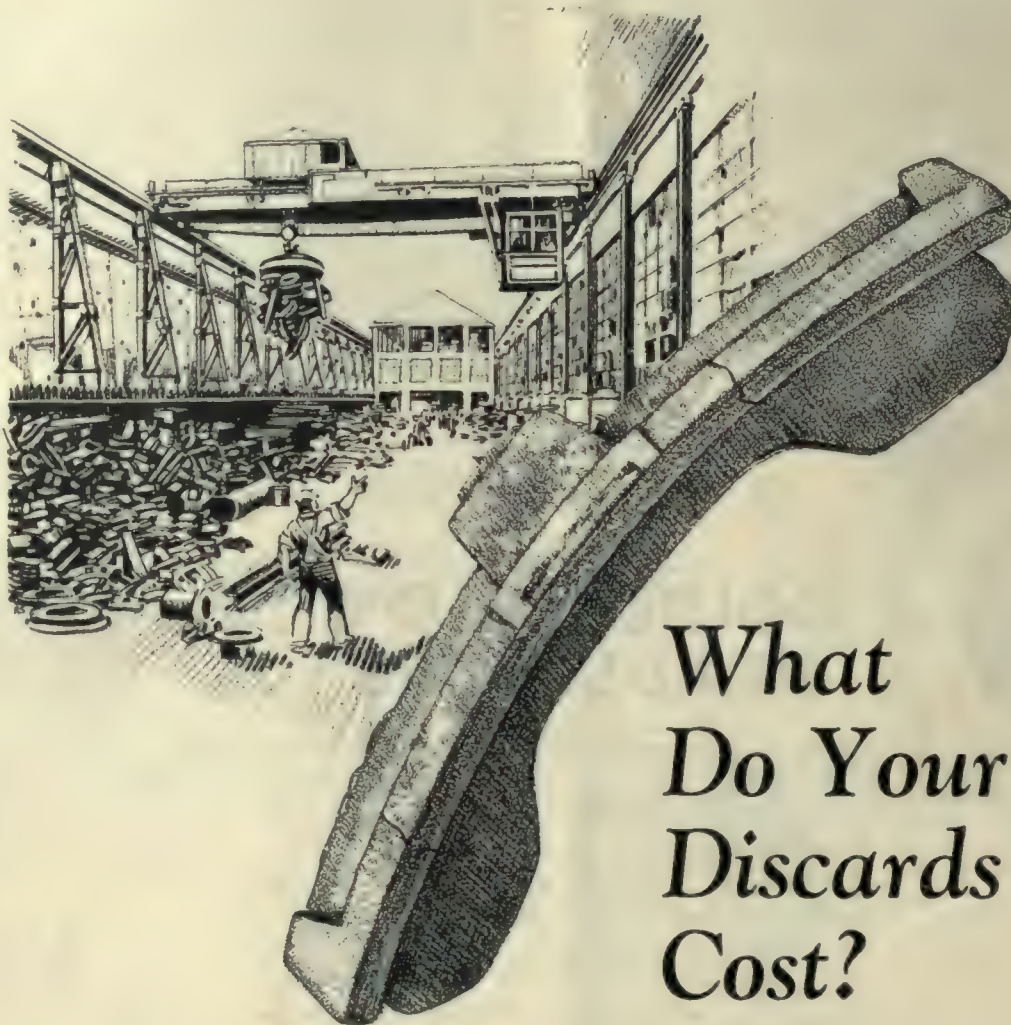


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“It gives me pleasure to recommend a machine of this type to anyone who desires a compressor for constant hard use, for we consider these machines a remarkable piece of equipment as we have run them repeatedly day and night for periods of months at a time with practically no attention or repairs. The writer is familiar with compressors of other designs and the operation of these under observation, and knows of many of the ills, such as valve trouble, overheating, bearing trouble, etc. We have only replaced a total of two valves since these machines have been put in operation, and only once have we had to shut a machine down for such a cause. The valves are the only repair part we have purchased excepting some of the contact fingers on the automatic starter.”

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Let us explain why and how!

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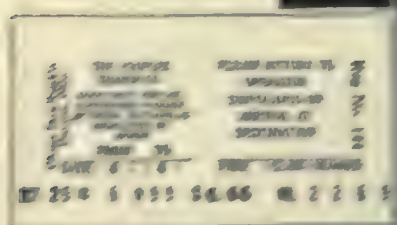
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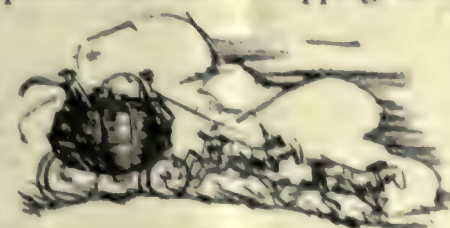
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For

Modern Equipment Standards

370-3

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Electric Railway Journal

Consolidation of Street Railway Journal and Electric Railway Review

Published by McGraw-Hill Publishing Company, Inc.

CHARLES GORDON, Editor

Volume 68

New York, Saturday, December 11, 1926

Number 24

Transit and Traffic Solution

Demands Broadened Viewpoint

IN THE larger cities of the world, and particularly in the United States, the traffic and transportation pot continues to boil and seethe. In London the suggestion is made in the reports of the Ministry of Transport's Advisory Committee, abstracted elsewhere in this issue, that there be set up a common management and a common fund to which all forms of passenger transport, including underground and surface railways and buses, would be parties. The board of management would be made responsible to an over-riding authority who would settle questions of community policy, determine the facilities required, control fare matters and exercise financial as well as physical supervision. Under this plan the governing motive would be the co-ordination of all facilities, so that each form of transport would perform the functions to which it is best adapted. Although no definite suggestions regarding a plan for their inclusion in such a co-ordinated system are made, the part played by the suburban service of the four main line railways entering London is mentioned. The entire proposal is based upon the premise that with proper co-ordination of facilities there is in London sufficient traffic to provide an adequate return on such a pooled investment, and also to make possible continuous improvement to meet the growing needs of the community.

Developments in New York show evidence of a growing appreciation on the part of thinking business men and the press that overlapping and competition of transportation agencies are not in the best interests of the city. There is apparent a unanimity of opinion among merchants and property owners in favor of less politics and more common sense in dealing with the complicated technical, economic and financial problems of transportation and street congestion. There is a growing sentiment against the fetish of the 5-cent fare at any cost in safety, convenience and comfort. A form of quasi-public corporation is being mentioned as a means of pooling present resources so as to bring order out of the present chaos. One or two city officials are beginning to call a halt on the orgy of reckless dissipation of the city's financial resources in ill-advised subway construction entirely independent of existing facilities. Quotation of huge deficits in the public press is beginning to make the people of the city realize the magnitude of the debt being piled up against posterity in meeting transit losses incurred in trying to make riders think they can buy a 10-cent ride for 5 cents.

Likewise in St. Louis the solution of the transportation situation seems to depend on a popular realization of the fundamental necessity of co-ordinating all existing facilities. No orderly and economical program of

development can be undertaken until that is brought about. Utilization of existing surface cars is recommended as the backbone of a transportation system for the city; putting them underground in the most congested district, and extending such costly work only as the growth of the city demands.

Thus in these several important cities, and in many others as well, there is a tendency to apply common sense to the transportation problem in place of hysteria and suspicion. Through lack of general understanding of fundamentals and because of inertia and lack of interest on the part of the public at large these vital matters have in the past been left in the hands of selfish politicians. The traffic hodgepodge threatens to halt civic development by converting the avenues of commerce and communication into helpless tangles of humanity and machines. Though these came together in the modern city to facilitate the progress of business and industry, they are being rendered impotent through sheer confusion and interference the one with the other.

That co-ordination of the several facilities of travel offers the only sane means of bringing some degree of order and economy out of the present hopeless confusion and waste is beginning to become evident to those business men and property owners whose attention has been directed to the seriousness of the present situation by the increasing difficulty of doing business in the congested districts of modern cities. There is likewise a growing realization, though it is yet largely in intangible form, that solution of the bewildering complexities of the situation produced by the movement of passengers and commodities in city streets depends on a broadened approach to the problem.

Although there is no definite program proposed for considering freight movement along with passenger transportation, the mention of the suburban traffic of the London railroads in connection with other forms of local transit is significant. Likewise, the similarity of the suggestions in London and New York for pooling all transportation interests is thought provoking. There exists now in New York, in the form of the Port of New York Authority, a body with ample power to approach the freight problem from the standpoint of the community as a whole. But here again there is consideration of only one of several elements. An adequate solution of traffic congestion and transit requires simultaneous consideration of both freight and passenger movement throughout a city and its tributary area. This must be approached with a view to the present and future needs of the community as a whole, rather than of any particular section or any one agency. Only then can a real community transit plan be devised, and only then will basic improvement and sound progress be possible.

Supreme Court Throws Further Light on Proper Basis for Utility Values

IF COSTS of construction did not fluctuate it would be a comparatively easy matter to determine the value for rate-making purposes of a public utility property. The basis for such value, though subject to certain modifications for depreciation, going value and other conditions, has been determined judicially to be cost of reproduction. But with fluctuating costs it becomes obviously an important matter to determine the date at which the reproduction is assumed. This has been especially true in recent years because of the great changes in construction costs since 1914. Hence this latter question has become of serious moment in the determination of utility valuation, namely, should properties or parts of properties erected when building was cheaper or more expensive be valued at the cost at that time or those which are in force at present?

Still another question in valuation, even more important than the one just asked, is: What effect on the value of a utility property will be caused by future changes in the units of construction cost?

The importance of the latter question is that valuations of utility property are undertaken usually not to determine the justice of past rates but the reasonableness of those in the future or early future. If the principle is adopted that present costs are to be used to determine future rates, it would seem only logical to have any new rates based on property values continue only so long as construction costs remain practically stationary. In other words, with value based on "cost of *present* reconstruction, new, less depreciation," a material rise or fall in construction costs should be followed by a corresponding revision of rates.

This, briefly, is the position taken in the majority opinion by the United States Supreme Court in the case of the Indianapolis Water Company decided Nov. 29. The court's rule of ascertaining present value is given in the following sentences:

If the tendency or trend of prices is not definitely upward or downward and it does not appear probable that there will be a substantial change of prices, then the present value of land plus the present cost of constructing the plant, less depreciation, if any, is a fair measure of the value of the physical elements of the property. The validity of the rates in question depends upon property value Jan. 1, 1924, and for a reasonable time following. While the values of such properties do not vary with frequent minor fluctuations in the prices of material and labor required to produce them, they are affected by and generally follow the relatively permanent levels and trends of such prices.

This seems to settle definitely and for all time the determination of the date to which prices of construction are to be referred. It is the present date, not that of the time of construction, or a ten-year average, or cost figures determined on any other basis. But in the part of the decision just quoted the court goes further than simply to define present value. It speaks of "a reasonable time," "fluctuations in the prices of material and labor," future values and future rates. These points are elaborated further on in the decision where the court declares:

In the light of all the circumstances, there must be an honest and intelligent forecast as to probable price and wage levels during a reasonable period in the immediate future. In every confiscation case the future as well as the present must be regarded.

In the case at issue, that of the Indianapolis Water Company, the court held:

There is nothing in the record to indicate that the prices

prevailing at the effective date of the rate order were likely to decline within a reasonable time, one, two or three years, to the level of the average in the ten years ending in 1923, and we may take judicial notice of the fact that there has been no substantial general decline in the prices of labor and material since that time. The trend has been upward, rather than downward.

The decision has many other interesting declarations which help to establish valuation law, such as the discussion of rate of return, not less than 7 per cent being considered justified in the case; on going value, for which 9.5 per cent was allowed; on the means for determining depreciation, which should be actual, not assumed, and on a number of other points. But to revert to the question of date of valuation, it is worth while to consider briefly the practical effect on construction policies of the application of this principle rather than the establishment for all time of a value based on prices as of a certain date, whether the time of construction, 1914, or the present.

The effect should be beneficial to both public and utility. The owner of private property who erects a building has to consider future trends in prices. He is penalized if he builds at a time of high prices and profits if he builds at a time of low prices, and he has to consider possible obsolescence and depreciation in the structure he is erecting. The same circumspection will have to be followed by utility operators in the future, whether they approve of this principle or not. The utility owners will be the only ones to suffer if they make mistakes in judgment by building at the most expensive times. But they will gain if they build at times of low construction costs, because in future rate hearings on the basis of present reproduction cost their property will prove more valuable than its actual cost at the time of erection.

The court also indicates its opinion of the frequency with which these rehearings on rates may be necessary. They are required only when there are relatively permanent changes in price levels and trends. As this is to be the law of the future, utilities will do well to keep their records of construction costs in such form as most easily to show the amounts and kinds of materials and labor used. In such a valuation inventory unit costs of any particular day can easily be applied to give the required value for rate-making purposes.

New Twin City Garage a Mark of Good Transportation Service

ONE of the differences between bus service properly co-ordinated and the type of operation that marked the early history of this vehicle is illustrated by the recently completed bus station at Minneapolis. In this city and its twin, St. Paul, the bus first made its appearance more than ten years ago. There existed also in these two cities one of the finest electric railway systems in the country, which reached its full development years ago under the able leadership of Thomas Lowry and Calvin Goodrich. Because of the notable success of this company, creating a demand for transportation, the jitney and bus found fertile fields for competitive operation. Eventually the company accepted the bus as a necessary part of the transportation systems and undertook to co-ordinate its service with that of the railway.

With the completion of the garage and bus station, concerning which a story was published in the issue of Dec. 4, the bus has obtained a sound footing in the Twin City transportation system. The bus as an operat-

ing unit has found a permanent home. This new station is more than a garage for storing vehicles during idle hours, it is more than a place to make repairs—it is a business home for the operating personnel as well. The men have locker rooms, well-equipped lavatories and showers, tables on which to count cash, fill out reports, study time-tables and perform such necessary functions. The buses too will not merely be repaired but they will be inspected and overhauled on predetermined schedules to avoid repair as far as possible, and with the same degree of supervision that has attended car operation.

Minneapolis furnishes only one recent example of what co-ordination means. Cincinnati, Philadelphia, Kansas City, Baltimore, Cleveland, Youngstown, Atlanta and many other cities are accomplishing much the same thing. It is the work behind the scenes, so to speak, that establishes that element of difference between the superficial and the sound, the transient and the permanent, the parasite and the servant.

American Business Entitled to Federal Tax Relief

THE announcement of a surplus from federal taxes, which promises to amount to as much as \$400,000,000, has precipitated a flood of suggestions as to how to dispose of it. President Coolidge originally urged a flat rebate on this year's income tax payments, but later seconded Secretary Mellon's suggestion of a credit on the tax payments due next March. The Chamber of Commerce of the United States recommends the reduction of the corporation tax and the elimination of the estate tax and the taxes on particular businesses. Representative Garner estimates that by giving the corporations a reduction of \$200,000,000, prices to the consumers will be reduced as much as \$600,000,000! Representative Hull says that the tariff should first be reduced. Senator Watson favors using the surplus to pay off debt.

With more than nineteen billions of Liberty Bonds outstanding, there seems to be little occasion to seek far afield for a suitable use for \$400,000,000. But apparently Senator Watson's conservative proposal will not receive the consideration its wisdom deserves, and somebody's taxes are going to be reduced. When the discussion reaches this point, American industry and business should insist upon a hearing. The time has come when the country ought to be asked to make up its mind deliberately whether it desires and intends that taxes on business shall form a permanent part of the federal financial system.

The most acute situation is that relating to the income tax on corporations. They now pay \$13.50 on every \$100 of profit. A stockholder, when he receives what is left of that \$100 as a dividend (\$86.50), may, at the most, take a credit of 5 per cent or \$4.33. In other words, a dollar of business profit, earned by a concern doing business under the corporate form and distributed as a dividend, must pay a special tax of something more than 9 per cent. A dollar of business profit earned under the partnership or individual form of organization does not pay this 9 per cent. In other words, our present heavy federal business tax is restricted to corporations.

Why should there be a special federal tax on business profits as distinguished from other types of income? If there should be such a business tax, why confine it to corporations? Should it not be as broad as business itself? These questions are momentous ones for

American business and they deserve careful consideration. England, faced with them, decided that she could not afford to impose a special business tax on corporate profits, despite her pressing need for revenue. The case against business taxation is a strong one and deserves careful consideration and co-operative action on the part of every industry in the country. Electric railways are particularly aware of the evils which grow out of the tendency to dig into private pockets indirectly for tax revenue by appealing to the popular expedient of using the corporation as a tax collector. This is bad enough in competitive business, where the tax enters into the price of the commodity. Although it is obviously unfair and unsound thus to penalize the corporate enterprise in favor of the partnership or private business, this tendency to load taxes on corporations becomes even more severe when the business is a regulated utility, in which the price of the product is subject to regulation and does not fluctuate smoothly in accordance with the rise and fall of the cost of doing business. It is obvious that every industrial association in the country should get back of the move to reduce the tax on corporations and that the joint committee on internal revenue taxation, established by the revenue act of 1926, should be devoting itself to an analysis of this problem and the formulation of a wise policy.

Passing the Buck

Will Not Solve Paving Problem

BY CHANGING from a rail transportation system to a trackless transportation system the Keighley Corporation Tramways, in England, escaped from a heavy burden of track and paving expense. Unfortunately, however, other expenditures were so greatly increased that the net result of the first year's operation was a considerable loss, while the last full year of tramway operation showed a moderate profit.

Adherents of the new system point out that the increased expenditures were largely the result of giving more service and that tramway operating costs probably would have risen had that system been continued. However, analysis of operating expenses per vehicle-mile does not support these contentions. In the way account substantial savings were made because paving costs were paid by general taxation instead of car fares. Elsewhere the savings attributable to the change from rail to railless transportation were negligible. As might have been expected, replacement of old vehicles by new ones reduced equipment maintenance costs somewhat. Conducting transportation costs fell slightly because of an increase in speed from 6.62 m.p.h. to 6.96 m.p.h. It is not unreasonable to suppose that a similar increase could have been made without difficulty by the tramways. General and miscellaneous expenditures remained the same. Power expense went up. The total cost of operation, including the paving charges carried by the municipality, probably was higher than it would have been if the tramway had been modernized.

By a process of reasoning similar to that by which the trackless trolley adherents in Keighley seek to justify their change in transportation service, some people in the United States find reasons for scrapping the street railways. But those who believe that something has been saved, when in reality money has merely been taken out of one pocket and put into another, are living in a fool's paradise. The way to solve the paving problem is to face it squarely. Sidestepping the issue only makes matters worse.

Co-ordinated Transportation Proposed for St. Louis

FIRST ARTICLE

Municipal Committee Declares Mass Transportation Must Continue to Be Provided by Electric Cars, Supplemented by Motor Buses and Rapid Transit Lines—Surface Car Subways Recommended for Downtown Area, Designed so as to Be Capable of Rapid Transit Use Later—Motor Buses Should Serve as Feeders—Present Facilities and Trends of Travel Outlined

LOCAL transportation in St. Louis is the subject of a report presented to the Board of Aldermen of that city on Sept. 24, 1926. It was compiled under the direction of the special rapid transit committee of the board by E. R. Kinsey, president Board of Public Service, and C. E. Smith, St. Louis, consulting engineer of the board. The report, which has just become available in printed form, occupies 338 printed pages, practically the same size as those of this journal, and replete with diagrams, maps and other illustrations. The report was authorized by the Board of Aldermen in October, 1924, following considerable public discussion. During its investigation the committee visited Philadelphia, New York, Boston, Chicago and Detroit.

THE PROBLEMS TREATED

The report points out that although city transportation and traffic problems have always been important, they have taken on a new significance by reason of the tremendous increase in the use of automobiles and the resulting spreading out of cities within the last ten or fifteen years. Traffic congestion came on suddenly with the automobile and will continue in varying degrees, depending on the success of relief measures. Street railway officials and citizens require education to make them realize that the provision of adequate transportation in large cities is a civic problem. Originally only a convenience, it is now one of the necessities.

The importance of planning transportation in city development is indicated by the results that have followed the neglect of such planning in the past. Electric cars are carrying passengers at speeds ranging from 4 to 40 m.p.h., the different speeds being due in large measure to the environment and different relations between the tracks and other lines of traffic. Present intolerably slow speeds may be increased by intelligent and persistent planning.

Failure of old-established electric railway lines to serve the public completely has led to the development of other and competitive agencies of transportation that have impaired the service given by the street railway. A good deal of this might have been avoided in the past



Distribution of Population in St. Louis in 1925. Each Dot Represents 100 People

and can be minimized in the future by intelligent planning.

Street car riders have been the worst sufferers from the increasing use of the automobile because (a) the normal increase in street railway business has been interrupted; (b) accidents and costs of operation have increased; (c) service has slowed down, and as the automobile has educated the people to higher speeds, they have become less tolerant of the speed of street cars, and (d) there is a popular idea that the street car should be got out of the way of other traffic and that it should be superseded by other means of transit.

Each year the street railways of the country establish new records for passengers carried, showing that despite the automobile and motor bus, which will supplement but not supersede them, street cars are here to stay and must be provided for. City transportation for the great masses of people must continue to be provided by electric cars, supplemented by motor buses and rapid transit lines.

In a city of 1,000,000 people, with prospects of 1,500,000 in the near future, the relation of means of transit to growth of the city is basic. The growth of

St. Louis reached the point some time ago where mass transportation facilities must be improved. Rapid transit facilities were provided in other large cities, even before the congestion caused by automobiles, and for the better movement of the people, as shown in Table I.

TABLE I—DATES OF INTRODUCTION OF RAPID TRANSIT IN DIFFERENT CITIES.

	Year	Population
New York City.....	1870	1,000,000
Chicago.....	1890	1,000,000
Boston.....	1893	500,000
Philadelphia.....	1907	1,400,000

It is evident that, by comparison, St. Louis has been ready for rapid transit for some time. Some of the advantages of rapid transit lines are:

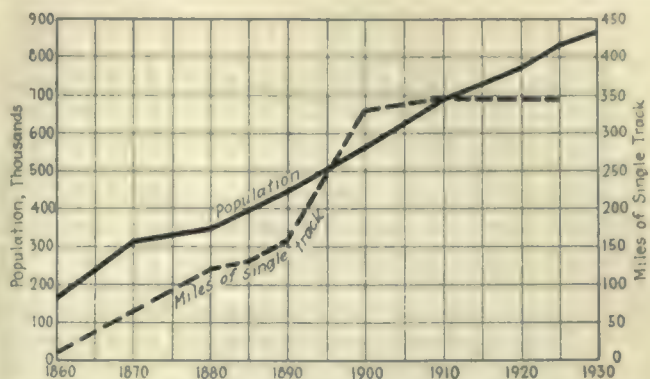
Relief from surface congestion and delay.
Increased capacity of streets for automobiles.
Increased safety on streets by removal of street cars.
Saving of time.
Outlying areas made accessible for homes.
Quickest, cheapest, most convenient form of transportation.

Street railway and bus lines relieved of long-haul traffic.
Cost of moving passengers in trains is less than in single units.

Removes crowding from street cars and permits them to give a seat to every passenger for short-haul and intermediate business.

Except in the congested business center, the stations should be not closer than $\frac{1}{4}$ mile apart; if adequate local surface transportation is provided, the stations should preferably be 1 mile apart. In the congested districts of heavy loading and unloading stations should not be more than $\frac{1}{4}$ mile apart to avoid too great concentration of passengers at stations.

The first step in rapid transit will be subways for street cars exclusively in the congested districts. In the second step, rapid transit trains will be operated



Street Railway Mileage and Population Within the City Limits, St. Louis, 1860 to Date

with some of the downtown subways extending out about half way through the city. Street cars will continue to operate between outlying and rapid transit lines and downtown to serve intermediate areas and to provide local service in the rapid transit area. Motor buses will also serve as feeders and to give local service in areas not settled densely enough to justify street railway lines, also to quite an extent for surface travel in the downtown subway area from which all car tracks will be removed. Traffic on the heavy street car lines can be expedited materially by running cars express between the business center and the points where the heaviest loading and unloading take place, the intermediate district to be served by buses.

CONDITIONS DIFFERENT FROM THOSE IN NEW YORK AND CHICAGO

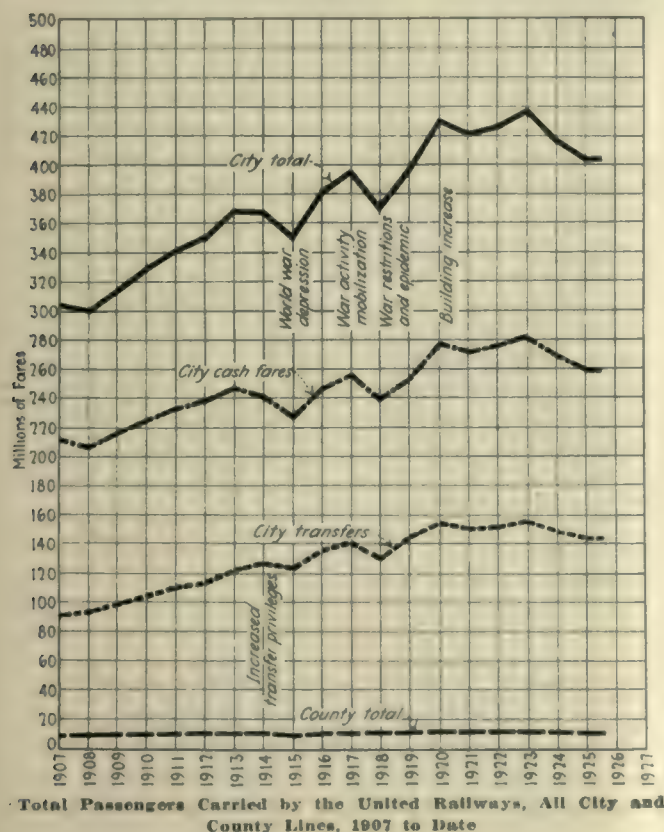
Conditions in New York and Chicago, calling for long through rapid transit routes, are not so comparable with conditions in St. Louis as are the conditions in Philadelphia and Boston. Boston has already done what has been recommended for Philadelphia; that is, first provide downtown subways in which surface cars may operate and which, when extended far enough out, can be used for the operation of rapid transit trains. There is much in the Boston plan that can be adapted to St. Louis. The difficulty experienced at Philadelphia by not having an operating agreement in advance of construction, which was avoided in Boston and New York by prior contracts, can be avoided also in St. Louis by having definite arrangements made prior to the construction.

Downtown subways will have a tendency to stabilize business in its present location by making it easier to get around there, and will thus encourage its growth in an orderly way in all directions from the present business center.

The operating expenses per passenger-mile on rapid transit lines, when properly supplied with passengers, is much less than on street railway and bus lines, and great economy can be effected by transferring passengers to and from the rapid transit lines, instead of hauling them long distances on street cars and buses. Long-distance street car riders are carried at a loss.

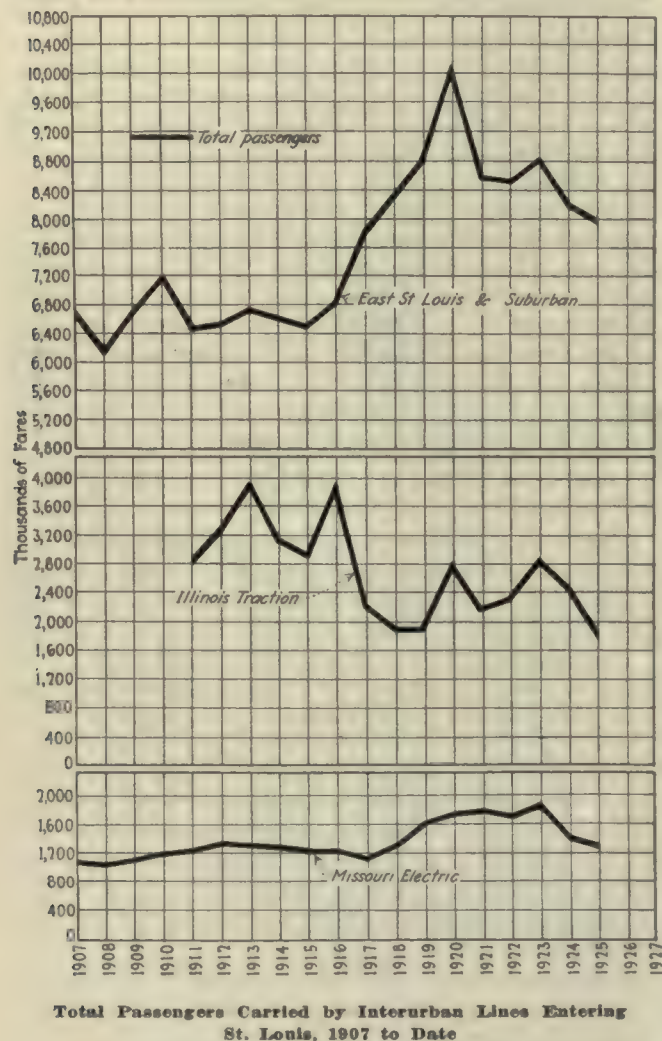
Duplication in transportation facilities and service is wasteful. Transportation can be furnished better and cheaper by a single transportation agency than by more than one. This single transportation agency should be planned to perform satisfactorily all the transportation that is needed of the classes desired by its patrons at the lowest fare.

St. Louis is certain to increase in population, as it



Total Passengers Carried by the United Railways, All City and County Lines, 1907 to Date

has an ideal combination of the chief factors for manufacturing and distribution. It is nearer the centers of agriculture, population, land area, mineral and timber production in the United States than any other large industrial city. Most of these centers are within a radius of 300 miles, and the wheat center and the cotton center of the country are only slightly beyond the 300-mile circle. St. Louis has an excellent climate and admits of open-air work more days in the year than any other large industrial city. It has waterway barge service to the Mississippi Valley and Gulf ports. It has lower taxes than any other large city. It is close to large supplies of cheap fuel and electric power. It has



great diversification in its industries, not more than 8 per cent of its labor being employed in any one line. It is served by more railroad lines than any other large city except Chicago.

The distribution of its 1,000,000 population in 1925 is shown graphically in an accompanying chart. The present average population density is now fifteen to the acre.

HISTORY OF TRANSPORTATION IN ST. LOUIS

The first attempt at mass transportation in St. Louis was an omnibus line started in 1843. By 1858 there were ten omnibus lines in operation; the headway on the busy lines was four minutes. The year 1859 saw the organization of ten horse car companies. By 1875 nearly all the settled districts in St. Louis were served by horse car lines, most of them competitive.

The first cable railway line was built in 1886. This was followed by other cable lines, which gradually were electrified. By 1899 all the lines, with one exception (the St. Louis & Suburban), were consolidated into one company, and in 1907 this outside company was included in the present system. The united company now has 247 miles of single track, ranking with other large cities of the country as shown in Table II.

TABLE II—ELECTRIC RAILWAY MILEAGE IN SEVEN LARGE U. S. CITIES, 1925

City	Population Served by Railways	Miles of Single Track	Feet of Single Track Per Inhabitant
Chicago (a) (b).....	2,940,000	1278	2.29
Boston (a).....	1,221,000	513	2.22
St. Louis (b).....	831,800	347	2.20
Pittsburgh.....	1,580,000	592	2.08
Cleveland.....	1,094,000	425	2.04
Detroit.....	1,200,000	383	1.68
Philadelphia (a).....	1,940,000	588	1.60

(a) Includes rapid transit mileage.
(b) Figures are for city only.

At the time of the consolidation, in 1907, free transfers were established between any line and any other. In 1914 the universal transfer system was inaugurated so that a rider might go on a street car from any part of the city to any other part for one fare, using three or four lines, if necessary.

NO EXTENSIONS FOR MORE THAN TWENTY YEARS

In 1904 the track mileage of St. Louis was large for the population of the city, but from that date the company has made practically no extensions. An accompanying diagram shows the increase in population and street railway mileage in various years. The lack of growth in mileage since 1900 is very striking. There was a constantly growing demand for extensions of the street railway lines, but the railway would not accede to them. In 1917 the city of St. Louis appeared before the Public Service Commission of Missouri and asked that the United Railways be made to extend its lines into undeveloped territories, and the commission ordered several miles of extensions. The company appealed to the Missouri Supreme Court, which ruled that it could not be compelled to build and operate them because it was not so obligated by its franchise. The company's apathy toward making extensions was due in the main to its financial difficulties since the consolidation.

The consolidated system was so badly overcapitalized in 1899 that by 1904 it was financially embarrassed by the necessity of refunding underlying mortgages. Some of the investment in horse car lines, and especially the heavy investment in the cable car lines and operating machinery, had been carried along into the capitalization of the electric car lines. From 1904 to 1919 the company used all its surplus above fixed charges to pay off maturing mortgages and to pay for necessary improvements, which were kept to the minimum.

The financial difficulties due to the 5-cent fare, combined with the loss in business and the increase in expenses, were offset in part by raising the rate of fare from 5 cents to 6 cents in 1918, then to 8 cents in 1919, and then back to the present fare of 7 cents in 1920. There has been no financial embarrassment due to insufficient earnings, as the company has consistently earned a comfortable margin for depreciation and surplus above interest on bonds, although capital requirements and poor credit due to overcapitalization made it necessary to reinvest in the property surplus earnings that otherwise might have been available for dividends.

People continued to locate beyond the ends of street car lines, particularly in the southwest and northwest sections, confident that the company would ultimately extend out to them, but as the years passed a gradually increasing resentment against the company made it easier for the Peoples Motorbus Company to secure privileges to operate motor buses in competition with the electric cars.

When the receiver took over the system, it was hoped he would extend the lines, but he soon announced his inability to do anything. After the Peoples Motorbus Company became an established competitor, however, the reorganization committee of the company organized the St. Louis Bus Company, to give extension service to the street railways that the receiver could not give.

LONG HAULS TO BUSINESS DISTRICT

Another source of dissatisfaction with the street railway system was due to conditions beyond the control of the company. St. Louis is roughly elliptical in shape. The primary business district is at one side of the city, close to the Mississippi River. The city limits are roughly 6 to 7 miles distant from the primary business district, north, west and south. Thus the average hauls are longer and the people have to spend more time on the cars than in a city where the primary business district is approximately central. This time is lengthened by the concentration in narrow business streets downtown of automobile, pedestrian and street car traffic, and this congestion is accentuated in the evening by a short peak period of about 30 minutes. This makes it absolutely impossible for the company to supply enough cars during that short period comfortably to carry the passengers. Many people are willing to pay a higher fare on the competitive motor buses. For various reasons, St. Louisans have moved prematurely from delightful high-level residence districts near the center of the city to districts farther out. This has further increased the difficulty of the street railway.

As most of the radial lines are 6 to 7 miles long, and cross-town lines much longer, and as there is comparatively little short distance riding, the St. Louis street car system has never suffered much from jitney competition, although with the longer time per trip of the cars much traffic has been lost to automobiles.

It is generally conceded, states the report, that properly to serve the primary business districts the present street surface must be given over to individual transit and that collective transit must be carried on at separated levels, either above or below present streets.

CITY TRANSPORTATION AGENCIES

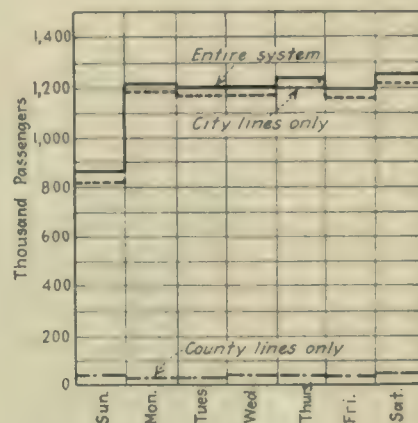
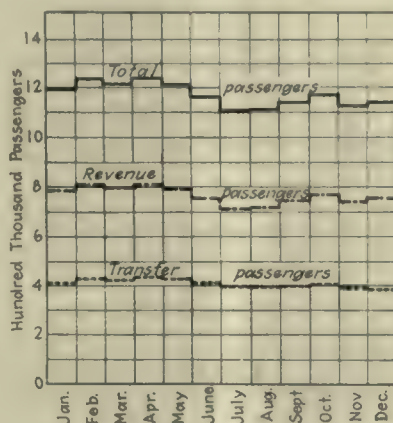
The companies now performing local and suburban transportation in and around St. Louis are:

1. United Railways of St. Louis.—This company operates the street railways in St. Louis and St. Louis County and the interurban line of the Missouri Electric Railroad, running from Wellston to St. Charles. Since April 12, 1919, the United Railways has been in the hands of a federal receiver, but it will shortly be reorganized as the St. Louis Public Service Company. The

United Railways handles about 270,000,000 cash fares per year and about half that number of transfer passengers. This comprises about 90 per cent of the total urban traffic, the other 10 per cent being carried by the Peoples Motorbus Company.

At the end of the year 1925 the United Railways owned 347.3 miles of single track in the city and 115.6 miles in the county, making a total of 462.9 miles of single track. It owns and operates a total of 1,608 passenger cars, of which 1,429 are motor cars and 179 are trailers. Of this number 201 cars are light-weight cars of the Peter Witt type, seating 60 passengers each. The physical property of the company is in good condition. The track is well built and is maintained in fine condition. The rolling stock, though some of the cars are very old, is clean, well painted and fairly well lighted.

The receiver claims that the company has not been making a proper return on its property value and operated during 1925 at a loss. In May, 1926, he applied to the Missouri Public Service Commission for an increase in fare.



At Left, Passengers Per Month During 1925, Daily Average. At Right, Average Daily Passengers Per Week During May, 1925, United Railways of St. Louis

2. Missouri Electric Railroad.—This company is owned outright by the United Railways, though retaining its corporate entity and operating as a different company. It owns 23.4 miles of single track and eleven double-track cars. A zone fare is in effect, there being three zones and a bridge toll to St. Charles. For the past two or three years the company has been subjected to severe competition by independent motor bus operators. During 1925 the company lowered fares in an effort to bring back some of its passengers and then installed non-stop de luxe bus service between the two terminals. This increase in service and the reduced fare has finally won back the traffic and the independent buses have gone out of business.

3. St. Louis Bus Company.—This company was organized by the reorganization committee for the United Railways to give extension service to the street railways. It operates single-deck buses in certain sections of the city and county that were in need of better transportation service. It gives and receives transfers from the street car lines and most of the rides are extension rides. The bus fare is 10 cents, of which the United Railways gets 7 cents whenever a transfer is made, the bus company receiving only 3 cents for a transfer passenger. This company began operation on Nov. 9, 1924, and operates 35 single-deck buses on eight lines over 30 miles of route.

4. Peoples Motorbus Company.—This company began

operations in St. Louis on May 28, 1923. It is a direct competitor to the United Railways and operates over many miles of streets having car tracks. It carried in 1925 about 23,800,000 revenue passengers, less than 10 per cent of the total riders. The fare is 10 cents with limited transfer privileges between bus lines, but no transfers to street cars. It began operation with seventeen buses. In 1924 this number was increased to 120 double-deck buses and 53 single-deck buses. The buses now operate twelve lines over 70 miles of route.

INTERURBAN ELECTRIC RAILWAYS

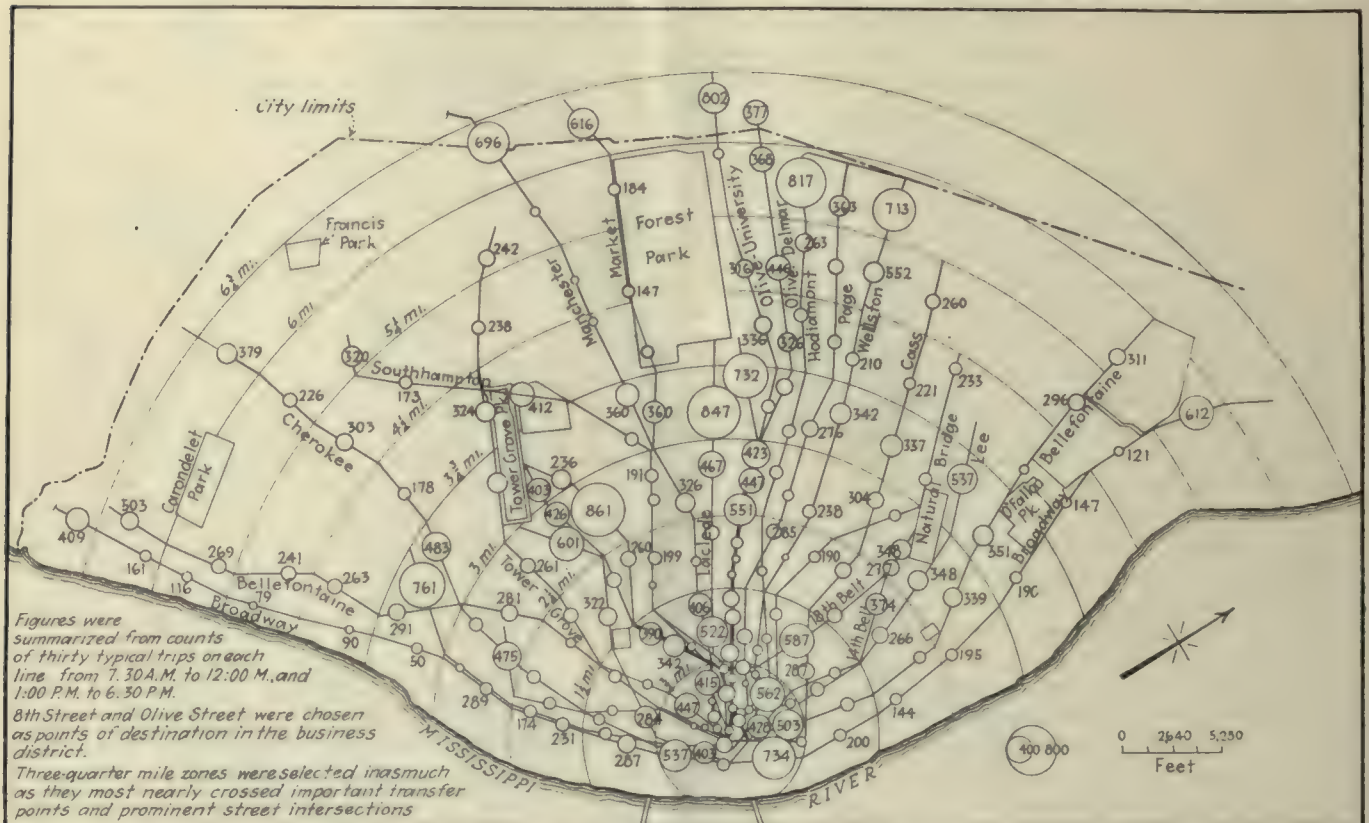
The territory surrounding St. Louis has been so well supplied by steam railroads that there has been comparatively little interurban electric railway development. Five electric lines extend west from the city limits,

that cross the river on bridges into downtown St. Louis. Their track gage is 4 ft. 8½ in., while the United Railways' tracks are 4 ft. 10 in. gage. This precludes the possibility of through operation, which would be undesirable otherwise because of different riding characteristics. These roads are:

1. *East St. Louis, Columbia & Waterloo Railway.*—This company operates a line south from East St. Louis to an undeveloped railroad and industrial district of Columbia and Waterloo Hill, 25 miles from St. Louis.

2. *East St. Louis & Suburban Railway.*—This company operates the city street railway system in East St. Louis and interurban lines to Belleville and Edwardsville.

3. *Alton, Granite & St. Louis Traction Company.*—This company is allied with the East St. Louis & Sub-



Relative Proportions of the Volumes of Travel Originating in Different Parts of the City Are Shown by the Number and Size of the Various Circles. Traffic as of January, 1920

more in the nature of suburban than interurban lines, as follows:

Ferguson, 11 miles from downtown St. Louis, with a 5-mile branch to Florissant.

St. Charles, 20 miles from downtown St. Louis.

Creve Cœur, 17 miles from downtown St. Louis.

Kirkwood, 15 miles from downtown St. Louis.

Meramec Highlands, 18 miles from downtown St. Louis.

The three first lines operate principally on private rights-of-way beyond the city limits and are capable of being developed as rapid transit lines by separating the crossings. The fourth and fifth lines practically parallel and serve the same territory as the Missouri Pacific Railroad.

INTERURBAN ROADS ON EAST SIDE OF THE RIVER

On the east side of the river, in Illinois, there are four companies operating interurban electric railways

urban Railway and operates lines to Edwardsville and Alton.

The three companies in East St. Louis operate their cars across the Mississippi River on the upper or highway deck of the Eads Bridge, in and out of the terminal of the St. Louis end of the bridge. When the steam railroad trains are transferred to the St. Louis Municipal Bridge, as proposed, these electric cars may be placed on the railroad tracks of the Eads bridge and operated at high speed on the lower deck free from all other traffic.

4. *Illinois Traction System.*—This company operates an interurban line from its terminal in St. Louis through 2½ miles of St. Louis streets to the McKinley Bridge, then across the Mississippi River through the streets of Venice, Madison and Granite City and over private right-of-way to Springfield and Peoria, 172 miles from St. Louis. This is the only long interurban line out of St. Louis. Its allied company, the St. Louis Electric

Terminal Railway, handles local business between the St. Louis terminal and Granite City. High-speed service is given by the traction system on its private right-of-way, but it is seriously slowed down in the city streets, especially St. Louis. It is making arrangements to detour its cars over private right-of-way around Venice, Madison and Granite City.

SUBURBAN RAILROAD SERVICE

Three steam railroads furnish suburban service from St. Louis, namely, Wabash Railroad, Missouri Pacific Railroad and St. Louis-San Francisco Railroad. The first does not use any depot, but loads and unloads in the open on the river front adjoining the business district. The two last mentioned use the Union station, about a mile from the business district.

SUBURBAN MOTOR BUSES

Motor buses are being operated on practically every road radiating from St. Louis. All are being operated

It will be noted that 1920 was the banner year in the history of transportation in St. Louis. Traffic from 1921 to 1923 continued approximately at the 1920 rate, but did not show the increase that should have been expected because there was a concurrent increase in the number and use of automobiles that apparently absorbed the increased travel due to the growth of the city. In 1924 motor bus competition began on a comprehensive scale. The decrease in street car riding from 1923 to 1924 was about the same as the amount of bus traffic. The increase in the number of bus passengers in 1925 was accompanied by a further decrease in the street car riding. In 1926 the traffic carried by the United Railways is on the increase.

A comparison of the riding on city lines, as just discussed, and on the interurban lines shows somewhat different characteristics. The decrease in riding in 1915 and 1917 as shown on the city lines was felt less in the country because the patrons of these lines are for the most part salaried business and professional people



Daily Flow of Traffic on Lines of the United Railways. The Lack of Direct Transit Facilities to the Northern and Southern Sections of the City Is Quite Apparent

into the downtown district and thus adding to the congestion. These buses should be compelled to provide bus terminals to avoid delaying traffic while loading and unloading in the streets. In future, when rapid transit routes extend out beyond the congested district, these bus lines should terminate at the outer end of the rapid transit lines and assemble and distribute passengers with those points as termini.

TREND OF STREET RAILWAY TRAVEL

Two accompanying charts show the number of passengers carried on the city lines and on the interurban lines, so far as the figures on the interurbans relate to total number of passengers handled in and out of St. Louis. It will be noted that the trans-river electric railway traffic amounts to only about 5 per cent of the revenue passengers in St. Louis. This must be kept in mind when facilities are provided for trans-river traffic in St. Louis.

whose work is not directly affected by business depression. The "break" or decrease in riding occurred in 1923, a year earlier than on the city lines. This is due to the greater use of the private automobile by the country dweller to go to and from his work.

LOCAL TRANSPORTATION CHARACTERISTICS

The next series of charts, four in number, relates to the character of riding on the lines of the United Railways of St. Louis. The first of these shows the origin of passengers on the lines entering the business district, the relative proportions of the volume of travel originating in different parts of the city being shown by the size of the various circles. The second diagram shows the travel over the different lines by the width of the lines. As will be seen, the greatest volume of travel is westward from the business district. The Olive Street line, the most heavily traveled line in the city, is represented by the widest line in the approximate center of

the map. The Page, Hodiament and Wellston lines are also easily distinguishable. The lack of direct streets which would afford direct transfer facilities to the northern and southern sections of the city is also quite apparent.

The two charts on page 1039 show the monthly and weekly distribution of travel. The monthly variation chart is compiled from 1925 figures and is based on the average passengers per day during the month, so that the variations caused by the different lengths of months disappear. It will be noted that there is not very much variation in this curve, especially during the first five months. July and August show some decrease as compared with the rest of the year. The weekly chart is based on the average for the days in question during May, 1925. This curve is also fairly flat, showing that the number of passengers is almost the same, irrespective of the day of the week, except on Sundays.

Hourly counts by lines show that on business days one-third of the passengers daily enter the central business district between 6 a.m. and 10 p.m. and that one-third of the people who do so leave the same district on the street car within one hour.

The afternoon rush period is characterized by a short, sharp peak, lasting about 30 minutes, from 5 to 5:30 p.m. During that time the street cars slow down and slow down other traffic by their delay in loading passengers. If means could be devised to spread this traffic evenly over one hour or an hour and a half conditions would be materially improved; all traffic would move faster and better street car service could be given.

The fact that one-third of the total street railway passengers enter the business district shows that it is at this point that the first step in rapid transit construction should take place.

Altogether 553 street cars enter the downtown business district within the maximum 30-minute traffic period, and nearly twice that number of cars enter during the next hour.

Railway Takes Tolls from Automobilitists

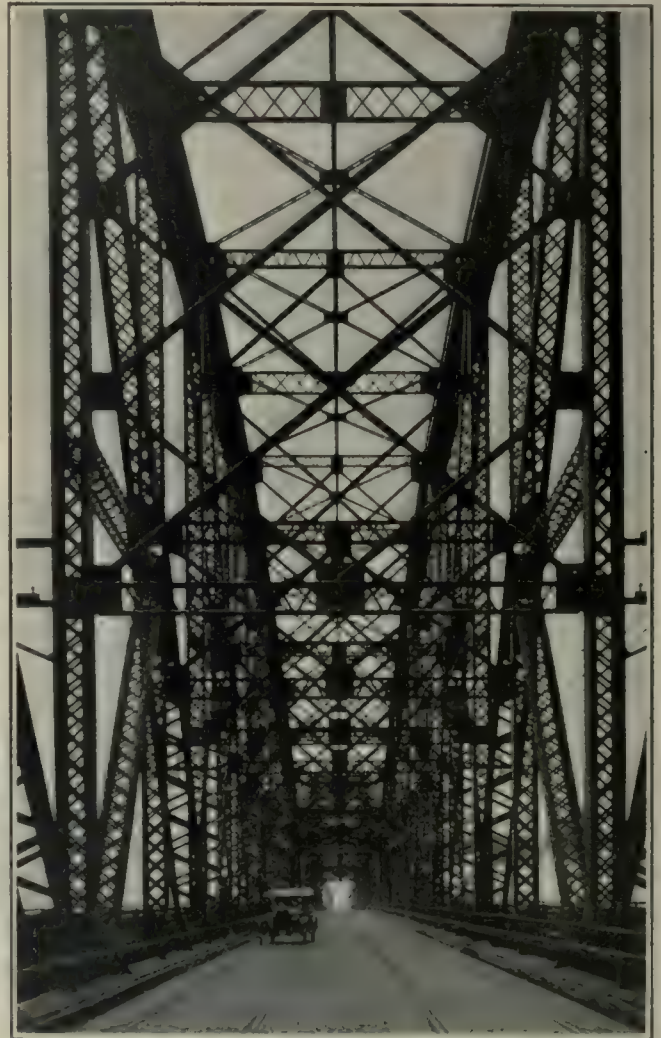
FOR most interurban lines private automobilists represent a loss of revenue. Even the Illinois Traction System has suffered to some extent from the great increase in automobile traffic which has developed in recent years. But the I.T.S. has discovered one way of getting revenue back from the automobilists. This is by charging tolls for them to cross the McKinley Bridge over the Mississippi River at St. Louis, as explained in the company's 1926 Coffin prize brief.

When the McKinley Bridge, which is the largest electric railway bridge in the world and one of the principal gateways to the St. Louis territory from Illinois, was opened to traffic, in 1910 it was not possible to foresee the great increase which was to occur in automobile transportation. Nevertheless, although the bridge was constructed primarily for electric railway service, provision was made for vehicular traffic through wings on both sides of the bridge. These roadways proved popular with automobilists, even though slow-moving freight vehicles and the higher speed passenger automobiles had to use the same roadway.

Somewhat more than a year ago the company decided to provide two roadways, one for the more slowly moving auto trucks and the other for passenger cars. Following out this policy, the company assigned the

side roadways to the former traffic and laid a paved highway for passenger automobiles in the center of the bridge. The publicity department of the company then put in effect an extensive advertising campaign, having for its purpose the popularizing of this toll bridge among the drivers of all kinds of vehicles crossing the Mississippi River at St. Louis. This advertising featured the separation of slow and fast traffic and also the fact that the bridge offered a short, desirable route between Illinois and Missouri points.

Altogether 416 painted highway signs were placed within a radius of 75 miles along the paved roadways.



Illinois Traction System Gets a Revenue from Automobilists by Laying a Paved Highway on the McKinley Bridge and Providing Separate Routes for Slow-Moving and Fast-Moving Motor Traffic

leading to the bridge. These signs not only carried an advertising message but told the number of miles and direction to St. Louis. These signs are supplemented by a series of red arrow "markers," placed along the main highways and directing the traveler to the McKinley Bridge. Other methods of advertising the route were also followed.

While the cumulative effects of these signs and advertising efforts are yet to be realized, the first month following their establishment showed an increase in the earnings of the bridge of 15.6 per cent over the same period the previous year. This increase was apparently wholly attributable to the campaign, since reports for previous months had shown no similar increases.



In Keighley, England, Local Transportation Is Now Furnished by a System of Double-Deck Trackless Trolleys and Single-Deck Gasoline Buses

Paving Burden Shifted by Changing the Type of Transportation

Substitution of Trackless Trolley Operation in Place of Tramway Service in British Industrial Town Reduced Way Maintenance Cost, but Other Expenses Were Increased and First Year Showed Large Deficit

KEIGHLEY, ENGLAND, is a town of approximately 42,000 inhabitants surrounded by a number of smaller municipalities. Two years ago all tramway service was given up and trackless trolley operation inaugurated in its place. This was done partly because the paving obligations had become very burdensome, due to the heavy vehicular traffic, and partly because much of the track was in need of immediate rebuilding. Although partial substitution of trackless trolleys or buses in place of tramways had been made in a number of other places, Keighley was the first city in England to undertake a complete change. Analysis of operating statistics for the first year of the new service shows that maintenance of way costs have been practically eliminated. Other expenses have been somewhat reduced when reckoned on a vehicle-mile basis, but the total annual expenditures were greater than before.

British law requires that tramways shall maintain the paving between the tracks and for 18 in. on each side. On the other hand, services which run without rails have to pay only the national automobile tax.

The Keighley tramway system comprised 6.62 miles of single track, of which about 2.50 miles was in dangerous condition before the substitution was made. To rebuild and pave this trackage would have cost about \$145,000, it was estimated. Other sections also were in poor shape and additional expenditures amounting to \$10,000 a year for renewals would have been

required to restore the property to good condition. Moreover, the cost of track and paving maintenance was about \$7,500 per year.

Replacement of tramway rolling stock was an impending need. The cost of twenty new trackless trolleys, and such changes as might be required in the overhead system, was estimated at \$187,500. While this sum was somewhat in excess of the immediate expenditures required to continue tramway operation, it was felt that the change would be more economical in the long run. It was decided, therefore, to provide an entirely new system of transportation for the city.

Because the tramway had been one of the largest customers of the municipal electric power station, and because of the existence of a sharp traffic peak at noon as well as between 5 and 6 o'clock in the afternoon, it was thought that trackless trolleys, with their greater carrying capacity, would meet the needs of the situation better than gasoline buses. Double-deck, top-covered vehicles seating 56 passengers each were purchased.

Comparison of results under the old and the new systems shows that fewer passengers are being carried now, although the vehicle mileage has increased. A seven-minute service is at present provided in place of the ten-minute service formerly operated by the tramway. Car-miles have increased from 246,061 per year to 355,916, or more than 40 per cent. Total passengers have decreased from 4,087,718 in 1924, the last

full year of operation, to 3,913,147. Passengers per vehicle-mile have fallen from 16.6 to 10.9, and revenue per vehicle-mile has decreased from 40.8 cents to 27.5 cents.

Establishment of competitive bus service is believed to have been responsible for the decrease in traffic. Although the buses do not actually pick up passengers on the trackless trolley routes, they carry many people who might otherwise use the trolleys.

Partly offsetting this loss there has been a considerable reduction in operating expenses per vehicle-mile.

and structures account. As was to be expected, equipment maintenance costs were less per vehicle-mile for the new trackless trolleys than they had been for the aged tramcars. Energy consumption decreased slightly per vehicle-mile, but line maintenance costs jumped up, so that the power account remained about the same. Due to higher speed of operation the vehicle-mile cost of conducting transportation was slightly reduced. General and miscellaneous expenses remained about the same. Detailed figures are shown in the accompanying table. British classification of accounts differs some-



The Double-Deck, Top-Covered Trackless Trolley Operated by the Keighley Corporation Tramway Has Seats for 56 Passengers

Present costs are only about 24.7 cents per car-mile as compared with 30.9 cents for the tramway in 1924. In making these comparisons the year ended March 31, 1924, has been taken for the rail system rather than the following twelve months because maintenance was neglected during the latter period in view of the prospect that the property would be scrapped. Figures for the trackless trolley are for the year ended March 31, 1926.

With the elimination of track and paving maintenance, a material saving has been made in the way

what from that usually followed in the United States, but the figures from Keighley are sufficiently detailed to permit allocation of expenses in a manner approximating American practice.

TOTAL EXPENSES INCREASED

While the operating expenses per car-mile showed a material reduction for the new system, the total annual expenditures were larger in all accounts except way and structures. This was due to the greatly increased car mileage operated. Total operating expenses were more than \$90,000 for the trackless system as compared with approximately \$80,000 for the tramway in 1924. To make matters worse the new system had to meet larger payments for interest and depreciation. Coupled with a reduction in gross income, this resulted in the loss of \$11,000 as compared with the net revenue of \$13,000 for rail operation in 1924.

The large expenditures made in 1926 by the trackless trolleys for interest and depreciation were mostly the

COMPARISON OF OPERATIONS

	Tramways	Trackless Trolleys
Passengers carried.....	4,087,718	3,913,147
Vehicle-miles operated.....	246,061	355,916
Average fare per passenger, cents.....	2.40	2.46
Revenue per vehicle-mile, cents.....	40.84	27.52
Expenses per vehicle-mile, cents.....	30.87	24.75
Operating ratio, per cent.....	75.57	90.12
Average passenger per car-mile.....	16.6	10.9
Average speed, mph.....	6.62	6.96

COMPARISON OF OPERATING EXPENSES

(Depreciation not included)

	Cents per Vehicle-Mile	Trackless Trolleys
	Tramways	
Way and structures:		
Permanent way.....	3.106	0.052
Cleaning, salting and sanding track.....	0.324	0.336
Buildings.....	0.028	
Total.....	3.458	0.388
Maintenance of equipment:		
Repairs to vehicles.....	5.332	3.038
Shop tools and plant maintenance.....	0.040	0.128
Total.....	5.372	3.166
Power:		
Energy consumption.....	4.048	3.886
Line maintenance.....	0.552	0.826
Total.....	4.600	4.712
Conducting transportation:		
Superintendence.....	0.472	0.348
Trainmen's wages.....	10.826	9.410
Cleaning and oiling cars.....	1.082	1.122
Station lighting.....	0.292	0.276
Ticket check.....	1.412	0.974
Uniforms and badges.....	0.458	0.268
Licenses, etc.....	0.078	1.462
Total.....	14.620	13.860
General and miscellaneous.....	2.818	2.828
Total operating expenses.....	30.868	24.755

result of factors not directly connected with their own operation. Previous to the general change-over, a short trackless trolley line at one time operated in conjunction with the tramways had been replaced by a bus line. Fixed charges for this old line are now paid by the new trackless trolleys, while the revenue of the route is credited to the bus operation, thus placing on the new system a burden which does not properly belong there. Fixed charges for the abandoned tramway system also are carried by the trackless trolleys.

Buses operated by the Keighley Corporation have been comparatively profitable and the revenue derived

FINANCIAL RETURNS FROM OPERATIONS

	Tramways	Trackless Trolleys
Gross earnings.....	\$104,600	\$102,000
Operating expenses.....	79,100	91,700
Gross income.....	\$25,500	\$10,300
Interest and depreciation.....	12,000	21,600
Net income.....	\$13,500	
Net deficit.....		\$11,300

from this source has to some extent offset the loss of the trackless trolley undertaking. The remaining deficit is made up from general municipal funds raised by taxation.

Despite the unfavorable financial showing of the first year's operation of the new system, the people of Keighley are well satisfied. It is asserted that the tramway probably would have fared equally badly had its operation been continued, as renewal of track and paving would have necessitated large expenditures. The ability of the trolley bus to approach the curb when taking on and discharging passengers is considered an important factor in its favor. The substantial increase in the amount of service rendered has pleased the public greatly.

Benefits of Eight-Car Trains Seen in Loop

A NEW high record was made by the Chicago Rapid Transit Company, Chicago, Ill., on Oct. 7, 1926, when 989 cars entered the Loop in the hour from 7:30 to 8:30 a.m. This is the greatest number of cars ever put into the Loop in a single hour in the history of the elevated lines.

The increase in seating capacity is due to the eight-car train operation. The number of trains entering the

Loop was 180 in the heavy rush hour. Before the installation of eight-car trains the usual number of trains entering the Loop in an hour was about 185, but the maximum number of cars never exceeded 910. The longer trains have made it possible to reduce slightly the number of units and increase the carrying capacity by approximately 80 cars an hour. That means an additional 4,000 seats in an hour. The increased capacity applies in about the same proportion to the evening rush hours.

80 Per Cent of Detroit Shoppers Use Public Transportation

Survey Made by Retail Merchants' Association Shows That 56.7 Per Cent Use Street Cars and 24.2 Per Cent Travel on Buses

DETROIT, the greatest center of automobile manufacturing in the world, relies on street cars to carry 56.7 per cent of its local traffic. Buses transport an additional 24.2 per cent, making a total of 80.9 per cent carried in public transportation vehicles. Private automobiles carry 19.1 per cent. These figures were computed as the result of a three-day survey made Nov. 10-12 by the Retail Merchants' Association. As one part of the city-wide traffic survey mentioned in ELECTRIC RAILWAY JOURNAL, issue of Dec. 4, page 1020, a check was made at 27 of the largest downtown stores to determine the means of transportation used by customers. At only one store did the users of private automobiles outnumber the users of public transportation vehicles, the automobilists in that case constituting 53 per cent of the total customers.

Nearly 200,000 customers were interviewed. Of this number 110,555 used the street car, 48,251 used the bus, and 36,272 used private automobiles. The percentages for the various stores are given in the following table:

SUMMARY OF TRANSPORTATION MEANS USED BY DETROIT SHOPPERS, IN PER CENT OF TOTAL

Store	Public Bus or Trolley	Vehicles Street Car	Private Automobiles Parked On Street	Private Automobiles Downtown Garage or Lot
Crowley Milner Co., department store.....	15	68	10	5
J. L. Hudson Co., department store.....	28	54	11	9
Ernst Kern Co., department store.....	30	56	11	11
Newcomb Endicott Co., department store.....	28	49	13	10
Frank Seder Co., men's clothier.....	21	56	7	11
Bedell Co., cloaks and suits.....	34	43	11	12
Himelock Bros., cloaks and suits.....	37	27	22	14
Peoples' Outfitting, furniture, etc.....	21	63	9	7
D. J. Healy shops, clothier.....	39	29	12	20
R. F. Fyfe & Co., shoe store.....	27	39	17	17
Heyn's Bazaar, women's apparel.....	23	55	13	9
Klines, Inc., cloaks and suits.....	33	48	11	11
The Rayle Co., hardware store.....	19	46	20	15
Grinnell Bros., music store.....	27	45	15	13
Russeks, cloaks and suits.....	38	26	18	18
Summerfield & Hecht, furniture.....	16	55	20	11
L. B. King & Co., retail clothing.....	29	39	16	16
B. Siegel Co., cloaks and suits.....	30	42	13	15
Threlk & Clark, men's clothier.....	31	29	11	22
S. L. Bird & Sons, retail clothing.....	23	43	16	18
F. G. Clayton Co., retail clothing.....	17	53	16	14
Chas. W. Warren Co., department store.....	20	25	29	24
Good Housekeeping Shop.....	28	33	27	12
E. J. Hickey, retail clothing.....	55	17	14	14
Browning-King Co., retail clothing.....	26	40	14	19
King Blair Co., retail clothing.....	30	33	22	15
Wright-Kay Co., jeweler.....	29	32	22	17
Total customers.....	48,251	110,555	20,393	15,879
Per cent.....	24.2	56.7	10.4	8.7

Free Parking Spaces Increase Street Car Riding

Many Motorists Avoided Congested Traffic During Fair Week by Parking Their Cars and Using Electric Cars of the Grand Rapids Railway to Reach the Fair Grounds

ONE of the big events in Grand Rapids is the West Michigan Fair, which is held there every fall. The fair grounds are located north of the city and one of the principal routes for motorists in reaching them is by way of Monroe Avenue, which runs through the city. The additional automobiles used by people going to and from the fair made this avenue very congested, so that movement was quite slow. The neck of the bottle, so to speak, was at a bridge over Grand River, a little more than $\frac{1}{2}$ mile from the fair grounds. Motorists who traveled out Monroe Avenue in congested traffic and then had to wait at the bridge were naturally glad to avail themselves of parking space at that point and ride the railway company's cars the remaining distance to the fair grounds.

With the idea of increasing traffic on its electric cars, the Grand Rapids Railway established free parking space at three different locations. One of these was at North Park, at a point just before the bridge over the river was reached. In this space, about $2\frac{1}{2}$ acres in size, the number of cars parked averaged from 100 to 150 per day during the week of the fair. Another parking space was established at the south side of the city, at what is known as the Detroit Street loop. This is a junction point for motorists coming in from the Kalamazoo district and other points south. By using this parking space motorists were relieved of the necessity of driving their cars through the congested city streets. The parking space on the south side consisted of about 3 acres and the number of cars parked there averaged from 50 to 75 per day during the fair.

A third parking space was established at Ramona Park. This is on the east side of the city and was convenient to the main roads from Lansing, Ionia, Flint and other towns east of Grand Rapids. The free parking space at Ramona Park consisted of a large tract and the number of cars parked there averaged from 25 to 40 per day during the fair.

In order to attract the attention of motorists to the free parking spaces, conspicuous signs were placed at the approach and entrance to the parking spaces. On the roads leading in signs were placed 500 ft. ahead of the free parking space. These read: "West Mich. Fair, Free Parking Space 500 Ft. Ahead, Watch for Sign." At the entrance to the parking space another sign read: "West Mich. Fair. Free Parking Space." A hand pointed the way. Inside the parking area a large sign was displayed giving advice regarding the avoiding of traffic dangers and accidents and pointing out that the electric cars provided a safe and comfortable ride to the fair grounds. This sign also gave instructions for obtaining car tickets without extra cost. These tickets were furnished by attendants at the parking places. These attendants directed motorists to the points where their cars could be parked and also supplied them with tickets, time-tables and other information about the railway. Through the use of this method the riding on the railway's electric cars was increased considerably.



As the Motorist Reached the Edge of the City his Attention Was Attracted by a Large Sign



The Sign Attracted His Attention by Referring to the West Michigan Fair and Stating that There Was Free Parking Space 500 Ft. Ahead



At the Entrance to the Parking Place a Conspicuous Sign Was Displayed Stating that Free Parking Space Was at Hand



Inside the Space Limits a Large Sign Directed Attention to the Fact that Car Tickets Could Be Obtained from Attendants



The Total Number of Cars Parked at the Various Places Averaged from 175 to 265 Per Day

"La Passe Hebdomadaire"

Success with One-Zone Weekly Pass on Levis Tramways Leads to Two-Zone Pass with Harder-to-Buy Ticket Rate—French-Canadian Population Has Been Induced to Ride by Many Appeals to the Ideals of Thrift

By Walter Jackson

Fare and Bus Consultant



Map of Levis and Environs, Showing Routes of Levis Tramways and Points of Interest in and near Levis and Quebec

FIRST among street railways in the Province of Quebec and the second in Canada to adopt the weekly pass as part of its fare plan is the Levis Tramways. Its one-zone pass was installed May 17, 1925, and a two-zone pass was added Nov. 22, 1925. The circumstances surrounding these applications are a little out of the ordinary and are worth discussion in connection with the results attained.

Levis County comprises the city of Levis, with a population of 11,000, and the town of Lauzon, with a population of 6,000. The latter comprises the eastern section, where are located the shipyards and drydocks. The railway, however, also serves the town of St. Romuald and two other villages, so the combined population is approximately 22,000. About 90 per cent of the people in the city of Levis live on the heights or upper level, while Lauzon and the town of St. Romuald lie along the narrow strip of lowland and foothills of the St. Lawrence River.

The railway system is operated in three divisions, known as the Up Town, which is in the city of Levis; Lauzon, which serves the town of Lauzon, and the Quebec Bridge line, which serves the town of St. Romuald and runs as far as the Quebec Bridge. The whole system is of suburban type, centering on the ferry to Quebec. The shipyards and drydocks at the eastern end of the line, with several lumber mills on the western end, are the only extensive sources of employment on the south shore. Most of the workers repair daily to the large city via car and ferry.

Within the one-zone ride

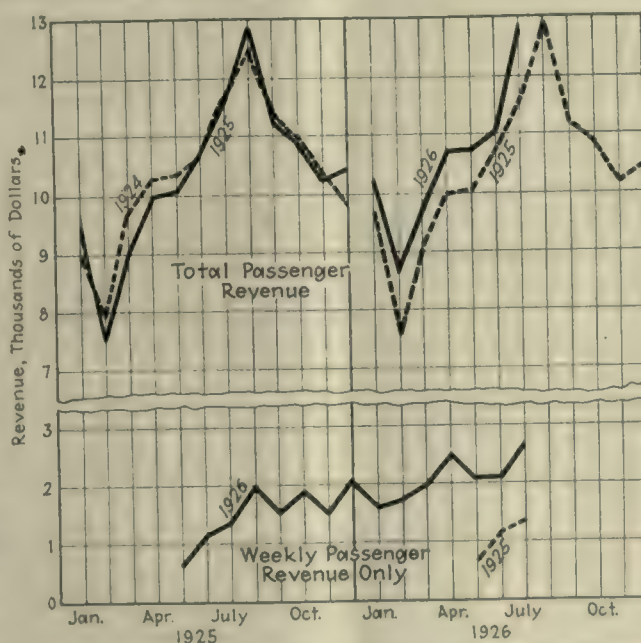
in the city of Levis are a group of small stores and one theater. There is a second group at the eastern end in the town of Lauzon and a third group within the village of St. Romuald. Levis and Lauzon are within the one-zone ride, while St. Romuald comes into a second zone. The heights residents of the city of Levis are confronted with the disadvantage of climbing to get to their homes. This is an advantage to the rail-

way, but, on the other hand, the railway is confronted with the disadvantage that these people can walk down in less time than the cars can carry them to the ferry. The traffic on the Up Town line in pre-pass days was therefore 100 per cent uphill and only 40 per cent downhill.

The churches and schools are located at such frequent intervals that persons can readily walk. Furthermore, the population is almost exclusively French and not given to riding abroad at night, as is proved by the low average number of rides per pass, viz., 2.5 daily in the one-zone area of Levis, compared with the more usual average of 3.5 to four net rides.

In any case, the center of diversified entertainment is Quebec itself. This means that even a passholder would have to pay additional fares and give up extra time for the ferry trip and also pay two more fares within Quebec if he wished to avoid the stiff climb so nearly won by Benedict Arnold.

Despite these ride-selling handicaps, H. E. Weyman, general manager, decided to add the weekly pass to the then existing fares in Levis for three purposes—increase of good will, easier



Graph Showing Improvement in Earnings of Levis Tramways, Particularly Since Addition of Second (\$1.75) Pass and Change from Four Tickets for 30 Cents to Six Tickets for 45 Cents

fare collection on one-man cars and better revenue through encouraging the public to ride downhill too.

The third reason explains why the pass price was fixed at \$1 against a cash fare of 10 cents and a ticket fare of 7½ cents (four for 30 cents). About 90 per cent of the riders were using tickets, with little or no short-haul riding. In fact, the average length of ride per passenger was approximately 2½ miles.

Usually the weekly pass covers the period Monday morning-Sunday night. The Levis pass is a proper exception in covering the period Sunday morning-Saturday night. One reason is that Saturday is the universal payday, and it is the custom of the people to spend what money they have on Saturdays and Sundays. A second and more local reason is that the French-Canadians are faithful churchgoers, in addition to which the after-church hours are very popular for visiting friends and attending to other social duties. Hence practically all pass-buying prospects are on the cars Sunday.

The immediate effect of the pass was to stop a decline in revenue, February-April, 1925, having run 4.7 per cent under the same period of 1924. Despite an unusual number of rainy Sundays in the summer of 1925 and the further disaster of a strike at the shipyards in August, the revenue for May-December, 1925, ran 0.6 per cent ahead of the like period of 1924. The year 1926, including January to July, shows a total revenue of \$73,956, against \$68,656, a gain of 7.7 per cent over the like period of 1925, when the pass had hardly been well introduced.

SECOND PASS KNOCKS OUT CHEAP ROUND-TRIP RATE

Satisfied that the weekly pass was proving a good thing for both the public and the railway, Mr. Weyman considered its extension to the second zone of the St. Romuald route. He agreed to the liberal rate of \$1.75 on condition that the manner of selling tickets be altered from four for 30 cents to six for 45 cents. This seemingly trifling change really was important, because many casuals who took a round trip could, and did, take advantage of the four for 30 cents rate instead of paying 40 cents cash. Thus it was easy for a person taking a round trip on the two-zone route to get a rate intended only for steady customers.

The \$1.75 pass was added Nov. 22, 1925, and caused an immediate system increase of 35 per cent in cash fares and of 2 per cent in pass and ticket revenue combined. Although the \$1.75 pass itself costs only 11½ rides at ticket rates, the actual increase in system revenue from transportation was 7.7 per cent. The accompanying graph shows how the pass stopped the decline in revenue and how the ticket change and \$1.75 pass accelerated the increase.

In this way a substantial decrease in fare to the regular rider, no change at all to the semi-regular rider and an optional increase to the casual rider produced more revenue and more patronage without any changes in service.

One good proof of the popularity of the pass under adverse conditions is that pass revenue now averages about 20 per cent of total earnings. Mr. Weyman's appreciation of publicity has had much to do with this result. In addition to his advertising in the press and to the many friendly editorial notices, he has made extensive use of placards both inside and outside the car.

AUJOURD'HUI! Achetez-vous une passe hebdomadaire

La passe hebdomadaire illimitée que vous pouvez acheter aujourd'hui même, est bonne jusqu'à samedi prochain. Chaque passe est bonne du dimanche à 4 hrs A. M. au samedi soir inclusivement, ce qui veut dire que vous voyagez autant que vous le voulez à moins de 5 sous par voyage. N'oubliez pas que vous pouvez passer cette passe à un autre, quand vous ne l'employez pas vous-même. C'EST LE TRANSPORT AU PRIX DU GROS.

LEVIS TRAMWAYS CO.

BUY A WEEKLY PASS TO-DAY!

The unlimited-ride weekly pass that you can buy today is good until next Saturday. Each pass is good from 4 a.m. Sunday to Saturday night inclusive. This means that you can ride as much as you please for less than 5 cents per ride. Don't forget that you may pass the pass to some one else when you do not require it yourself. This is transportation at wholesale prices.

POURQUOI N'ACHETEZ-VOUS PAS?

Comme tous les voyageurs, une passe hebdomadaire pour permettre à votre famille de voyager sur les chars quand vous ne vous en servez pas. Procurez à votre épouse ou à vos enfants une occasion de faire une course en tramway pour prendre le frais air.

LEVIS TRAMWAYS CO.

WHY NOT BUY A PASS

Like other passengers to permit members of your family to ride the cars when you are not doing so? Give your wife or one of the children a chance to get some fresh air by way of a car ride.

ACHETEZ VOTRE PASSE LE SAMEDI

Le conducteur de ce char sera heureux de vous vendre une PASSE HEBDOMADAIRE

Achetez une passe le samedi pour toute la semaine.

Vous ferez autant de voyages que vous le desirerez pour \$1.00

LEVIS TRAMWAYS CO.

BUY YOUR PASS SATURDAY

The conductor of this car will be pleased to sell you a Weekly Pass. Buy a pass on Saturday for use all of the week. For \$1 you can make as many trips as you please.

Several of these placards are reproduced, together with translations. Another (not reproduced) read as follows:

Achetez Une Passe

Et quand vous ne vous en servez pas, prêtez-la à quelqu'un pour aller à l'église, au magasin ou faire visite à des parents ou amis. Faites des Passes Hebdomadaires ce que vous faites d'un bain dan vos familles. Servez-vous en tous, mais un a la fois.

Translation

Buy a Pass

And when you are not using it, lend it to some one else to go to church, to the stores or to make a visit to relatives or friends. Use a Weekly Pass as you would a Family Bath—All use it, but one at a time.

INAUGURATION OF PLEASURE TOURS FOR TOURISTS AND LOCAL PATRONS

In connection with the map, it may be mentioned that during the summer of 1926 the management inaugurated combination tours for both tourists and local patrons. One tour is a combination of taxi, ferry and trolley to near the end of the Quebec Bridge; a second

combination covers an automobile or coach trip to Charny, the remarkably interesting Chaudière Falls and Basin and Quebec Bridge, and return by trolley with a fine trans-river view of Quebec; while the third covers a bus ride to St. Michel de Bellechase, with luncheon on a farm. The respective charges are \$1, \$2 and \$2.50. In this way the south shore of the St. Lawrence has been made as accessible to the sightseer as the long-familiar north shore. Tickets for these trips are sold in Quebec at the Château Frontenac and at various railway and tourist agencies.

On the occasion of the Aug. 7, 1926, Levis historical number of the Quebec *L'Evenement*, the Levis Tramways used a full page of display advertising to feature its share in the growth of the community and to announce the foregoing new services which, in themselves, will do much to make Levis and environs better known.

In this advertisement the company mentioned that it operated 12 miles of track, had equipment valued at \$900,000, used modern cars averaging a cost of \$10,000 each, paid out \$60,000 to \$70,000 a year in salaries and wages and carried 2,000,000 passengers a year. The transferability of the weekly pass also received special note. The advertisement concluded thus:

"The service of the Levis Tramways is comparable to that of the largest cities in America, and the public has reason to be satisfied therewith."

Baltimore Studies Energy Consumption of Cars

Oscillation Tests Help to Determine Energy Taken in Car Operation and Result in Improved Methods of Lubrication

FOR the last year and a half the United Railways & Electric Company of Baltimore has been making a systematic investigation of the factors entering into the energy consumption of car operation and available means for its reduction. An account of means for utilizing the heat wasted in motor rheostats for car heating in cold weather was published on page 892 of the issue for Nov. 13. In addition, a series of tests has been conducted to determine the extent and character of other preventable losses, and the company hopes, as a result, to reduce its power bill further by from \$100,000 to \$175,000 a year. Particulars are given in the company's brief in the Coffin award contest, and from that statement the following facts were taken:

First came a series of oscillation tests. The primary purpose of these tests was to determine the frictional losses of cars under existing service conditions, to ascertain the most economical kind of lubricant for the Baltimore system, and to determine the savings to be achieved through relubrication of the cars. Next came a series of energy consumption tests, which was simply to check up the results of the oscillation tests.

For the oscillation tests a valley between two hillsides was selected. The grades on either side of the valley were approximately 6 per cent. The car was placed on one of the inclines 700 ft. from the lowest point of the valley and at an elevation 36.27 ft. higher than this point. At this elevation the car had approximately 1,632,000 ft.-lb. or 0.615 kw.-hr. of potential energy. Then, when set free, it coasted down the incline, ascended the opposite grade and then oscillated between the two inclines until it finally stopped

at or near the lowest point in the valley, having dissipated all its potential energy in frictional losses.

During the tests the number of oscillations made by the car, the distance traveled on each oscillation and the total time elapsed before it came to rest were recorded. Dividing the car's total potential energy at the start by the total distance in miles traveled gave the investigators the frictional losses of the car per mile. Cars which were efficiently lubricated naturally made more oscillations, covered longer distances and consequently showed lower frictional losses per mile than others in which the lubrication was defective. It was thus possible to determine the relative merits of different grades of lubricant.

Not only was this a test of lubricants but a test of the effect of temperature, brakeshoe clearance and general condition of maintenance, with all the disturbing factors such as varying voltage, loads and traffic conditions eliminated. The cars tested were selected at random from among cars at one of the big terminals, and the investigators found quite a difference in the adjustment of the brakeshoes and that some of them had little clearance. The tests, extending over a long period, indicated that it was possible to reduce friction in a well maintained car by as much as 50 per cent.

Thereupon an analysis of the movements of more than 1,300 cars was undertaken for the purpose of discovering a new method for determining proper periods for oiling and inspection of individual cars. The investigators endeavored to learn to what extent the devices on cars for recording the number of minutes during which power is used might also be used to determine a proper frequency for inspection and oiling. It was necessary to fix constants for each type of operation, and the percentage of each type of operation, such as dense traffic, suburban and rural, were checked so that the limits of accuracy would be definitely known. As a result, the company is now oiling one line by the minutes of power consumed, based on an indicated unit of 2.5 minutes of power use to the mile. It finds this method much more satisfactory than the former one, in which oiling and inspection was done on a time basis, and the new plan will be extended over the entire system. It will also use these data to determine the mileage performance of individual cars. Hitherto, the mileage records of the cars have been kept by a special bureau. It is believed the present plan will provide a more accurate record and at a large reduction in clerical and tabulating machine cost.

To maintain proper control over this entire set of experiments the company is constructing curves which show the energy consumption and the various factors affecting it from month to month. These curves show the average monthly kilowatt-hour consumption per car-mile per month, the average temperature per month and the average weight per car-mile per month. The consumption has been found to vary almost exactly inversely with the temperature. To eliminate the necessity of comparing one curve with another, the investigators have constructed a curve running back over the last five years on which the temperature curve has been inverted and plotted downward from the top of the sheet. This inverted temperature curve has thus become the company's standard, and the object is to reduce the kilowatt-hour curve as far below the temperature curve as possible. So far as the company knows, its use of an inverted temperature curve for a standard is original in the electric railway industry.

Pooling of London Passenger Transport Facilities Proposed

London and Home Counties Advisory Committee, in Two Reports, Suggests Working Agreement Between All Local Passenger Transport Facilities, Including Rapid Transit Railways, Electrified Railroads, Tramways and Motor Buses—Only in This Way Can Waste of Service Be Prevented

SETTING up of a common management and a common fund to which all the passenger transport undertakings in London, including the Underground and other local railways, the tramways and omnibus lines, would be parties, is the outstanding recommendation of two reports made by the London and home counties traffic advisory committee of the Ministry of Transport on the subject of improvements in and co-ordination of passenger traffic in London. One of these reports, which deal with transit problems in the London area, covers north and northeast London and the other east London. The inquiries on which these reports were based were held before a committee of which Sir Henry Maybury was chairman, the former on ten days between Oct. 10 and Nov. 26, 1925, and the second on seven days between March 10 and 29 last. A third inquiry, relating to southeastern London, was only recently completed. No inquiries were held in regard to other districts of London, presumably because the facilities are better there.

In the first report is contained a summary of the evidence and suggestions put forward for a common management and a common fund. It is stated that a comprehensive and far-reaching proposal for meeting the difficulty of finance, which appears to be the stumbling block of all schemes of railway development in Greater London generally, was put forward on behalf of the Underground group. This proposal is not, however, confined to the problem presented by the conditions obtaining in the north London area, neither does it appear to be intended to meet only the difficulties of today. The proposal aims at a permanent solution of the whole problem of London passenger traffic.

The common board of management would, under the plan, be responsible to an over-riding authority who would settle questions of policy, determine broadly the form and nature of the facilities to be provided, settle the principles upon which fares would be charged on each form of transport, and generally exercise financial control. An outstanding feature of the scheme is that there would be no disturbance in the ownership of the existing undertakings. Their officials, who would constitute the board of management for operating purposes, would therefore have a dual responsibility, on the one hand to the owners of their undertakings and on the other hand to the over-riding authority. Under this proposal it is suggested that all the existing forms of transport could be co-ordinated so that each would be performing the functions for which it is best adapted, and the present uneconomic and wasteful competition could be eliminated, while it would be practicable to give the public more efficient services than at present are given.

The question whether the suburban service of the

four main-line railways should be included as a part of this plan was touched upon, but the evidence on the point was not sufficient to allow of any definite conclusions being drawn. The matter, however, is one which will require further consideration.

STEADY DEVELOPMENT A NECESSITY

The proposal is based on the premise that, given such co-ordination, there is in London sufficient traffic not only to provide a satisfactory return on the large amount of capital already invested in transport undertakings, but to provide also a margin of income which would enable a steady growth and continuous policy of development to be pursued.

The Metropolitan Railway, a section of whose undertaking forms an integral part of London's local underground system of railways, suggested that a scheme for common management presented considerable difficulties for the reason that it involved a common financial interest in traffic, but all the transport interests represented at the inquiry, with the exception of the independent bus proprietors, seemed to be in general agreement that a condition precedent to any further expenditure on the development of railways is co-ordination of street transport and the restriction of omnibus competition having regard to the alternative facilities provided.

This view was not fully accepted by some representatives of local authorities and other public bodies present at the inquiry, who appeared apprehensive that their difficulties are being exploited by the railways for the purpose of obtaining a cessation of bus competition. The London County Council, however, is on record as favoring unified operation of local passenger transport undertakings under a municipal traffic control authority, provided that in the event of a reorganization of the local government a new authority might be set up by the municipality.

SPECIFIC PROPOSALS FOR NORTH AND NORTHEASTERN DISTRICTS

The committee is led to the conclusion that the difficulty of passenger transport between the districts north and northeast of Finsbury Park and the central London area is primarily because there has been no adequate increase in through traveling facilities to meet the large increase in population in the past quarter century. A large proportion of the public is forced to make at least one transfer. Moreover, the facilities for changing cars, especially in inclement weather, are the main reason for the discontent of the riders from this district.

The lack of efficient and rapid transport facilities has retarded the development of the area. Given ade-

quate and rapid transit an increase of at least 50 per cent in passenger traffic might reasonably be expected in the course of a few years.

There was a strong expression of opinion that in not improving certain of its local lines and in not electrifying its suburban system the London & North-eastern Railway has exhibited a want of consideration for the needs of the suburban traffic. It was urged that the result of this failure to keep abreast of the times is that, as compared with other railways, its services are costly, slow, infrequent and inconveniently arranged. Until it is electrified, it is felt that this railway cannot render any material assistance to the solution of the problem. Further information on electrification of this system should be obtained. The reluctance of the railway to embark on the work of electrification might be removed if it were assured that steps would be taken to insure that the electrified lines would be protected from unnecessary competition, so that the railway might be afforded the fullest possible opportunity of obtaining a reasonable return on the additional capital invested. Specific recommendations for an extension by the London Electric Railway and suitable transfer facilities were made.

As to the electric railways, the accommodation provided is greatly in excess of the demand, the seats provided in each direction on the Piccadilly line, for instance, on a normal day being 75,000 for 18,000 passengers.

It was mentioned that 18 per cent of the total tramway passengers are carried at unremunerative workmen's rates provided by statute. With ordinary fares there would have been a gain in revenue of £114,000, or 5 per cent on the capital of the company. The buses are not required to offer similar fares and do not provide corresponding service in the rush hours.

Prior to 1922 all the omnibus service in the area was operated by the London General Omnibus Company and its associated companies, which appear to have had some regard to the alternate facilities provided by the tramways. Beginning at that time the number of independent competing buses has rapidly increased, and in order to protect itself the L. G. O. Company has felt it necessary to increase substantially the number of its buses. As a result there is no longer that co-ordination which up to 1922 had existed between the bus and tramway undertakings and buses operate in large numbers over the whole of the tramway routes in the area.

It was contended that neither tramways nor buses would meet adequately the needs of the public in the outer areas, on account of slow speed and limited accommodations. The average speed of the buses in the London area was, in fact, found to be slightly less than that of the tramways, being 9 m.p.h., as compared with 9.6 m.p.h. for the tramcars.

Finally, the committee pointed out that it has been impressed by the contention of the representatives of the railway companies and the tramway undertakings that the main difficulty in the way of the provision of suitable through facilities is the acute and wasteful competition between the various passenger transport agencies operating in the area. The proposals submitted on behalf of the Underground group appeared to it to furnish a possible solution of the whole problem of London passenger transport. It was recommended that these proposals, referred to earlier in this article, should be carefully examined with the least possible delay. The committee, feeling that consideration of the plan

was outside the scope of its assignment, requested the Minister's authorization before proceeding further with it.

PLANS FOR EAST LONDON

In the second report, that on east London, the committee states that the inadequacy of the through railway traveling facilities to and from that section generally has been established. This condition exists because the improvements in the facilities have not kept pace with the increase in population which has taken place during the past 25 years, and the even greater increase in the number of persons desiring to travel.

It is clear, in the opinion of the committee, that electrification of the steam railway lines in this area would afford the speediest means of providing a substantial improvement in the train services. A representative of the Metropolitan District Railway, who has had considerable experience in the operation of electric train services, stated at the inquiry that experience has shown that the capacity of a line can be increased from 100 to 200 per cent by conversion from steam to electric working.

Similar statements relative to wasteful competition of trams and buses were made as those referred to in the report on north London. Throughout the day only about 21 per cent of the available bus and car seats were occupied, while even in the peak hour no more than 56 per cent of the car seats and even fewer of the bus seats were occupied.

With regard to competition, the committee stated: The evidence submitted by the representatives of the local authorities, particularly those owning tramway systems, as to the adverse effect of unnecessary omnibus competition with tramways provides sufficient justification of the soundness of the policy adopted by the committee with regard to the restriction of such uneconomic competition.

Finally, the committee desired to add that the evidence submitted at this inquiry strengthens its view that no lasting solution of the London passenger transport problem can be secured so long as the present competitive methods are pursued. It is only by the elimination of all wasteful, uneconomic and unnecessary competition between the various transport agencies that it will be possible for any considerable improvements to be effected, particularly in the way of the construction of new underground or surface railways. As a means toward this end the committee, in its report upon the inquiry on the traveling facilities to and from north and northeast London, stated that the proposals submitted at that inquiry for the establishment of a common management and a common fund appeared to it to present a possible solution of the whole problem of London passenger transport. The evidence submitted at the inquiry upon which this report is based has convinced the committee that the unified management of the local passenger transport agencies—i.e., underground and other local railways, tramways and omnibuses—would provide the only permanent solution of the whole problem of London transport.

Speaking in the House of Commons on Nov. 30, Col. Wilfrid Ashley, Minister of Transport, stated in reply to a question that after consideration of the recommendations in the two reports he has asked the London traffic advisory committee to explore further the possibility of the institution of a common fund or of working agreements in connection with the operation of passenger traffic undertakings in the London area.

The Readers' Forum

Saving Paper in Committee Reports

NATIONAL ELECTRIC LIGHT ASSOCIATION

NEW YORK CITY, Dec. 6, 1926.

To the Editor:

Your editorial of Oct. 16 headed "Too Much Paper Used in Some Committee Reports" was of great interest to this office, as in the last 2½ years we have been proceeding along the lines of your editorial, and, thanks to the hearty co-operation of all concerned, with considerable success. Under the leadership of C. F. Hirshfeld, chairman, the Engineering National Section has been making a determined effort to make its reports as pithy as possible with the result that whereas in the year 1923-24 31 Engineering Section reports required 1,141 pages of type, 36 reports in the administrative year 1925-26 required only 992 pages. This is a reduction in the average size of reports from 36.8 pages to 27.5 pages.

The same policy of condensation has been applied to all reports and, thanks to the efforts of A. Jackson Marshall, secretary of the association, and the chairmen of the other sections, we have been able to reduce the size of our Proceedings from 1,912 pages in 1924 to 1,664 pages in 1926. We do not feel, however, that the maximum brevity has been attained and all efforts are being made toward increased economy in language and maximum content of information.

K. M. ELISH,
Editor Publications.

Figures on Car Speed in London

WALLINGTON, SURREY, ENGLAND, Nov. 26, 1926.

To the Editor:

Table V in Mr. Jayot's article on page 891 of the JOURNAL of Nov. 13 gives the average car speed of the London Tramways as 6 m.p.h., almost the lowest in the table. Actually, the average speed is 9.6 m.p.h. on the principal, or London County Council, system and slightly more on the combine systems. The average is therefore, apparently, the highest of the cities enumerated.

Apparently the figures relating to passengers carried annually and number of cars in service in London refer to the combine systems only. It is not clear why London is credited with only 416 cars in service when L. C. C. system has 1,850 cars in stock apart from the combine.

Furthermore, the 1,086 cars listed against Glasgow refer to cars in stock, not average in service.

I observe that while figures are given for the Leeds system several much larger British systems are not included. Hence the data given in the table abstracted from the paper by Mr. Jayot are not very representative.

HENRY A. WATSON.

EDITOR'S NOTE.—As explained in the article, the figures given in table V were based on replies received to a questionnaire sent out by the International Association. The table contains only the data of those systems which replied. In the case of London the replies relate only to the Metropolitan Electric Tramways, the London United Tramways and the South Metropolitan Electric Tramways but do not include the London County Council Tramways. As only part of the London tramways were represented, no figures were given in the columns showing population served and annual rides per inhabitant for London.

As One Passenger Sees It

SAGINAW, MICH., Nov. 10, 1926.

To the Editor:

On a recent trip I made on electric interurban lines in Michigan and Ohio I encountered a number of practices which suggested reasons why some of these lines are losing passenger traffic. On leaving the terminal there were approximately 100 passengers on one car.

After getting as many as possible on board this car, several were turned away. There seemed to be no one in authority to tell them whether or not another car would be added. After quite a delay a second car was coupled on. Before reaching an important intermediate station all passengers going beyond that point were transferred to the head car, which was already well loaded. Thereafter it was packed, several women sitting in the smoking compartment. This car was built of wood, needed paint and was very dirty.

In the terminal city I found that the interurban stations were quite a distance apart, forcing a person with baggage to use a taxicab to get from one to the other. On the next lap of my journey I rode a two-car train. This was a very comfortable ride. The cars were clean and equipped with white seat covers. The power was weak, however, and the speed was entirely too slow to meet with public approval.

Then, too, there have been few improvements made recently in seats. Why not install seats similar to those being used in motor coaches, with air cushions that are really comfortable to sit in, and space them farther apart than the present car seats? It would make very little difference in the total seating capacity—possibly about two seats.

Electric roads must now depend on through traffic and the small lines should be consolidated in order that through service can be given over a larger area. If consolidation is impossible, through cars should be operated. At present, in order to get between two important Ohio cities, a stopover of 1½ hours at an intermediate point is necessary. How can the railways expect to get traffic when such conditions exist?

Great care should be taken when selecting platform employees, as they are the ones who come in contact with the public. There should be a meeting held at least once a month and the men instructed in the art of salesmanship so they can really sell transportation to the public. Courtesy to the public is the most important qualification for being an efficient platform man.

Most people would prefer an interurban car to a bus if they both gave the same quality of service. Congestion on the highways has become severe. Now would be a good time for the electric railways to start giving the kind of service that would win back the public favor they formerly enjoyed.

It seems to me that electric lines would do well to advertise more in the daily papers, calling the attention of the public to the fact that they are selling transportation for far less than the cost of operating an automobile. Some time ago I was talking to a man who uses the electric interurban to get to and from his work every day. It costs him about \$60 a year. He said his neighbor who works in the same factory bought a used automobile, paying \$300 for it, and at the end of a year of traveling back and forth it was worn out. Thus one year's transportation cost the second man \$300 besides the upkeep of his automobile. Why not do more publicity work to tell the public about such cases as this?

A DAILY INTERURBAN RIDER.

Maintenance Notes

Cleaning Mechanical Parts Prolongs Life

GREASE, dirt and brake shoe dust are removed readily from mechanical parts by boiling in an Oakite solution in the shop of the Reading Transit Company, Reading, Pa. Thoroughly convinced that in order to prolong the life of certain mechanical parts it would be essential to give more careful attention to their cleanliness during the overhauling process, H. E. Aldrich, master mechanic, searched for suitable equipment to accomplish these results. Inability to obtain in the market just what was required, necessitated the designing, building and erection of equipment with the shop organization from the material on hand.

The principal parts of this equipment consist of a tank with heating pipes, atomizing oil burner, oil storage tank and suitable pipe connections. The general arrangement of this apparatus is shown in the accompanying sketch. The tank is constructed of $\frac{1}{2}$ -in. boiler plate rigidly reinforced with $\frac{1}{2}$ -in. angles and 1-in. x $\frac{1}{2}$ -in. flat steel. An 8-in. iron pipe welded to the tank directly in line with the atomizer winds its way

around the bottom of the tank and gradually reduces in size until it makes its exit to the atmosphere at a diameter of $2\frac{1}{2}$ in., this reduction being made to prevent rapid heat exhaust. The flame from the atomizer entering the 8-in. pipe raises the temperature of the solution very rapidly to the boiling point. Storage of oil is taken care of by an 8-in. x 36-in. tank conveniently located on the wall above the atomizer. Air is used to force the oil from the tank to the atomizer as well as to assist

in the vaporization of the oil at the atomizer. Since motor bus engine oil discarded from the crank case is used for fuel the cost of operation is extremely low.

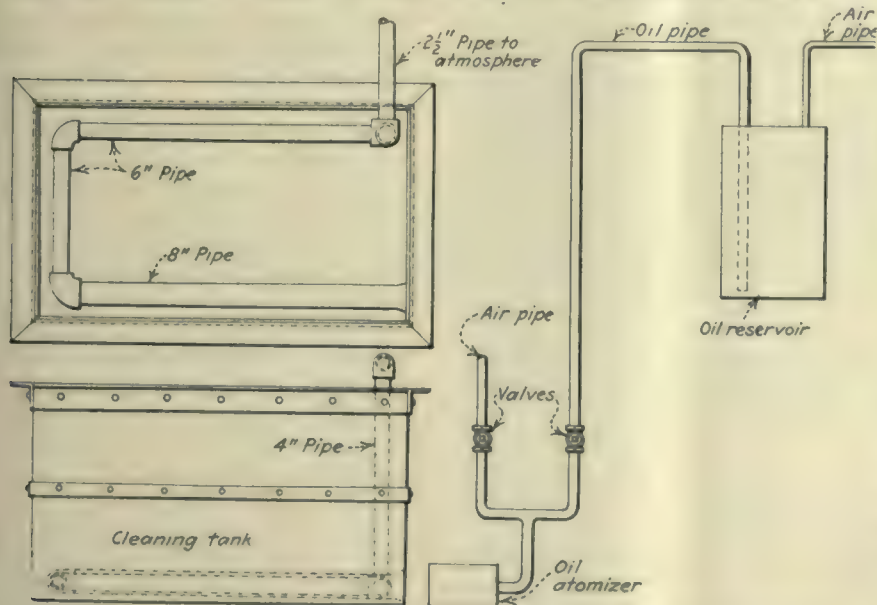
Equipment to be cleaned, such as motor housings, gears, pinions, journal boxes, trolley bases, bearings, etc., is immersed in the Oakite solution and permitted to boil for a certain length of time. After removal it is found to be free from grease, dirt or brake shoe dust. This apparatus has proved a valuable addition to the equipment of the Reading Transit Company's shop and the results which have been obtained have been far greater than expected.

Portable Paint-Spraying Equipment

PAINT spraying is not an innovation in the shop of the York Railways, York, Pa., but the desire to concentrate the spraying equipment in a portable manner led E. L. Greene, master mechanic, to design and build a small compact truck for this purpose. This truck is about 18 in. wide and 4 ft. 6 in. long and is constructed of 1-in. oak boards fastened securely to suitable steel axles. Iron wheels, 6 in. diameter and $1\frac{1}{2}$ in. face, and a neat oak handle

make movement throughout the shop easy.

On the front of the truck is a 16-in. by 48-in. vertical air reservoir with a gage and safety valve. It is held in place by $4\frac{1}{2}$ -in. tie bolts



General Arrangement of Cleaning Tank, Oil Storage Tank, Atomizer and Piping for Cleaning Metal Parts



Paint-Spraying Equipment Mounted on Truck

fastened to saddles over the top of the tank and angle irons bolted to the truck floor. A National AA-1 compressor bolted to the floor on the rear end of the truck furnishes the necessary compressed air for spraying. A De Vilbiss Manufacturing Company's paint-spraying equipment is conveniently mounted on a

tapered oak plank between the compressor and the air reservoir. The pistol grip type spray gun is used.

This paint-spraying equipment, with its tank and compressor painted black and the remainder with color combinations corresponding to the car colors, presents a very attractive appearance. The compactness of design, together with the ease with which it can be moved about, gives the shop a portable outfit readily transferable to any point and a means for doing quickly and effectively any desired painting job.

Time Saved by Grinding Armature Cores

GROUNDING or short circuiting of armature coils usually results in burning the armature core laminations. These burns and blisters must be removed in order to rewind the armature properly and not allow projecting edges to damage the wind-

BURNING off grounds on electric railway systems is a practice confined most generally to the medium-sized systems rather than to either the small or large ones. Small systems do not follow it because they have not the generator, converter or feeder capacity in service to burn off a heavy ground without overloading the machinery or feeders, so there would be as much likelihood of burning up one of these pieces of apparatus as there would be of burning off the ground. Again, the delay to the line on account of leaving a circuit breaker out until the ground can be cleared is by no means as important in a small town as it would be in a large city.

Should Grounds of Electric Railway Systems Be Burned Off?

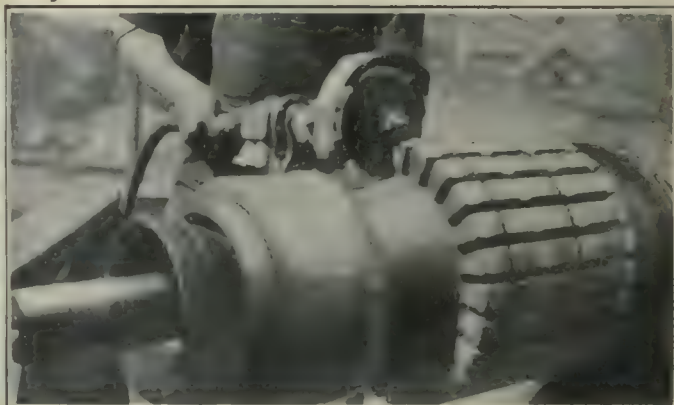
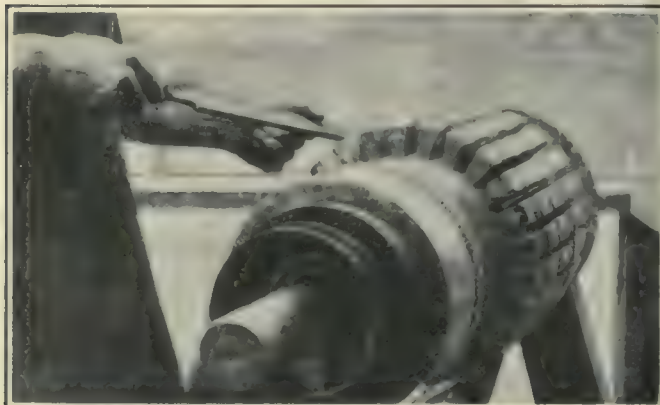
By G. H. McKELWAY

Distribution Engineer Brooklyn-Manhattan Transit Corporation, Brooklyn, N. Y.

panies, as a rule, the pendulum of practice swings back to the same position as for small companies, although not for the same reason.

The large company has at least as much objection to delay as the medium-sized one has, if not more. It has all of the generator capacity necessary for burning off the grounds and the increased cost of repairs is negligible. The objection to burning off grounds on large properties is based not on greater cost of repairs, but on greater liability of accidents that would injure people or result in greater damage to the railway company.

A broken trolley wire falling on and perhaps entangling itself around a



At Left, the Old Method of Cleaning Armature Slots and Removing Blisters from Laminations Was by a File. At Right, with the New Grinder the Time for Cleaning Armature Laminations and Slots Has Been Reduced 50 Per Cent

ing. Where the armature core slots are cleaned up by filing the operation is quite long and tedious. In the Hall Street shop of the Grand Rapids Railway this work is done by a portable air grinder. An emery wheel 4 in. in diameter by $\frac{1}{2}$ in. thick is used. This is driven by a No. 7 Simplex air grinder. In order to prevent particles from flying about the shop a guard has been placed over the wheel. This is 2 in. wide and is made of a piece of band steel welded to the frame at both ends. By use of this method blistered laminations are cleaned up in 50 per cent of the time formerly required by filing.

Another reason why the small company does not find it advisable to burn off a ground is the additional cost of repairs. The destruction of a part of the trolley wire and the annealing of much more of it may mean a great deal to a struggling line. Therefore certain companies prefer to have a little longer delay and be able to repair the trouble by the use of a single splicer.

When the system is in a city of 50,000 or more inhabitants there is a much greater chance of the power or substation attendants keeping the circuit breaker closed and attempting to burn off the grounds when they occur. The station and feeder capacity are greater, the objection to delay is greater, the cost of repairs is relatively small, and there is not such close co-operation between the men of the power and line departments. With very large com-

crowded car will cause a flash, which will probably frighten some of the passengers. There is still more liability of this occurring if the single flash caused by the falling wire is followed by additional ones, as the station operator closes the circuit breaker several times in succession, or holds it shut in an effort to burn off the ground. Injuries to passengers are caused not alone by burns from the arc, but by bruises and cuts occasioned by the stampede which may result from a series of flashes.

Even if the wire falls clear of the car and grounds on the rail, attempts to clear the ground will be delayed if it is arcing. When the ground has burned off the wire will usually be found to have been annealed back to at least the first side feed. As a result several sections of trolley wire will have to be run in, and this will result in a "moving block" that often

Many an armature that gets "het up boils"
May be traced indirectly to "bad order" field coils.

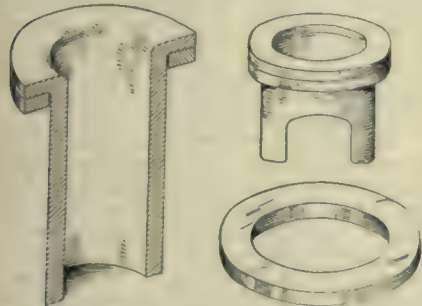
will cause more annoyance than the short delay to the entire system.

If the ground is on a feeder much more power is required to burn it off, especially with a system consisting of underground cables, such as are often used on large systems. There is greater danger of the trouble spreading on such installations from one cable to another and at least involving several cables so as to cause a bad burn-out and a prolonged delay, not to the one line alone but to several, and with the expense of repairs running up into thousands of dollars.

A wreck on a third rail line is liable to ground the conductor rail, and by trying to hold in on such a ground cars may be set on fire and possibly cause serious accidents. On the Brooklyn surface lines it is the custom to close the breaker at once if it has opened, and then, if it comes out again, to wait a half minute before closing it. If it comes out a third time it is the practice to notify the chief operator and close the breaker at longer intervals, as instructed by him. On third rail lines the feeder is always picked up first on a test resistance to see whether the breaker came out on an overload or on a ground. If the latter is the case, it is left out until the ground has been cleared, it being tried out on test resistance from time to time.

Bearing Flanges Reclaimed

UNDERSIZE armature and axle bearing flanges are being reclaimed in the shop of the Lackawanna & Wyoming Valley Railroad,



Reclaimed Bearings and Cast Ring. Axle Bearing at Left and Armature Bearing at Right Show Rings Installed

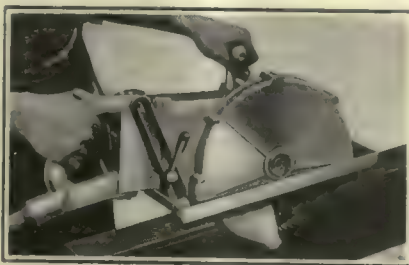
Scranton Pa., by the installation of a cast ring of the same chemical composition as the bearing. The worn outside surface of an armature bearing and one surface of a cast ring are machined, sweated together, riveted and turned to standard size. In the case of an axle bearing, the ring is sweated and riveted to the back face of the flange and then turned to size.

New Equipment Available

Portable Electric Hand Saw

FOR use in sawing lumber on construction jobs, the Wappat Gear Works, Pittsburgh, Pa., has placed the "Alta" portable electric hand saw on the market. It is provided with a universal motor and cuts boards as thick as 3 in.

A special feature of the device is a telescopic guard which incloses the blade and opens automatically when



New Type of Portable Electric Hand Saw the saw is pushed into the material. The guard closes again as soon as the cut is completed. This provides safety against accident and also protects the blade from damage. To prevent tipping, a wide carrying shoe supports the weight of the tool so that the only effort of the operator necessary is to guide the saw. The shoe is adjustable so that it may be set for any depth of cut.

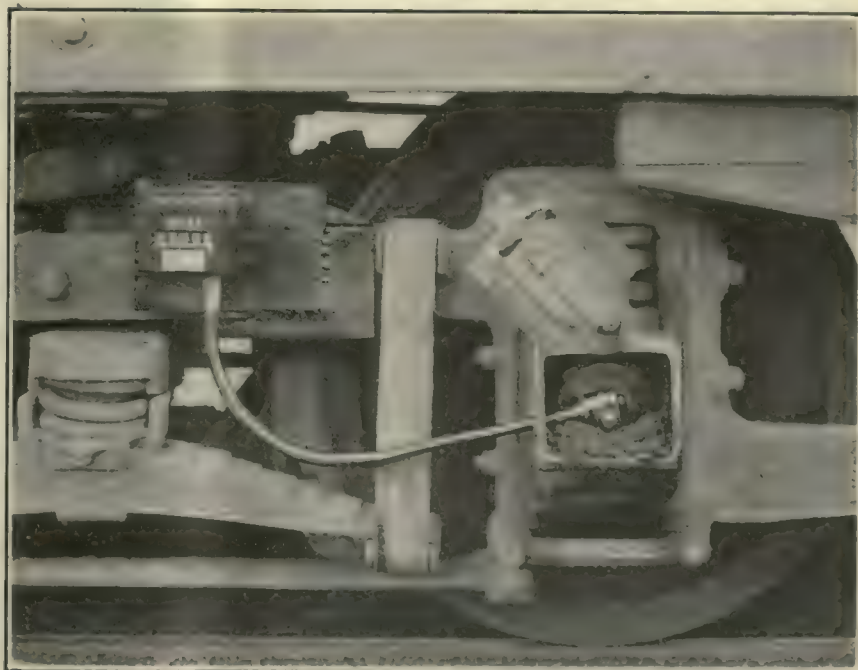
An air blast from the motor ventilating fan is directed to the front

of the saw blade to blow dust away. Particular attention has been given to placing of the handle so as to give good balance and to eliminate wrist strain. The outfit weighs 31 lb.

Odometer Used on Street Cars

MILEAGE is recorded in both a forward and backward direction by an odometer which has recently been adapted for use on electric cars by the Ohmer Fare Register Company, Dayton, Ohio. It was described in *ELECTRIC RAILWAY JOURNAL*, July 4, 1926, but the first installation for street car use has just been made. As shown in the accompanying illustration the device may be mounted on the truck frame and connected by a flexible shaft to the worm gear attached to the axle in the journal box. This shaft rotates very slowly, making but 63 turns to each mile traveled by the car. Thus there is but little wear and tear on the mechanism of the odometer.

The figures shown in the recording window of the odometer are large and easily discernible from a considerable distance. The figures snap into place as each mile is covered, so that there are no half figures to interfere with the reading of the mileage.



First Odometer Installation for Street Car Use

Association News & Discussions

New York Subways Saturated

President of Interborough Rapid Transit Company Tells Institute of Electrical Engineers No Relief for Transit Is in Prospect Until Greater Track Capacity Is Provided

FRANK HEDLEY was introduced before the audience at the meeting of the American Institute of Electrical Engineers in New York on Friday evening, Dec. 3, as the president of the Interborough Rapid Transit Company and the editor of the "Subway Sun." Before he launched into the subject of giving the facts with respect to passenger movement over his lines Mr. Hedley said he would like to tell the truth, the whole truth and nothing but the truth about rapid transit in New York, but the institute meeting was neither the time nor the place.

It seemed unusual to him that a man should be asked to speak about transit who has devoted most of his life to the study of the subject. His own feelings were very much like those of his own customers. They thought they knew more than he did about running the railroad, and he often thought that he knew more about railroad matters than did his president, so when he was elected to the post of president he kept both titles and is now both president and general manager.

Traffic figures which he quoted were startling in their totals. Mr. Hedley said, however, that his friends among subway riders were not disposed to doubt the veracity of his remarks. Their experiences, particularly in the subway, led them to think Mr. Hedley was conservative in his totals. Mr. Hedley said that his riders might be likened to tenants, of whom there were 3,500,000 a day, and many of them left gum behind them on the seats as a final decoration.

The burden of Mr. Hedley's remarks was to the effect that the eight main line tracks on the system were saturated with trains at the rush hour and that the situation could be relieved only by the construction of additional tracks. One of his quips was that the capacity of the subway today resolved itself into the question of the physical strength of the people who push themselves in. His aim was to tell what the company did with what it had to do with. The success attained was due to the assistance of the heads of the various departments, and the best results were secured only by discussion among the men themselves. The criterion of the company was the greatest number of passengers that could be transported with safety.

As a measure of the extent of the service of the company, he said that on Nov. 29 3,875,000 passengers had been carried safely on both the ele-

vated and subway lines. The original subway had been built with an estimated capacity of 300,000 passengers a day and a maximum estimated capacity of 500,000 passengers a day. Only a short time after the lines were opened the company was carrying 1,000,000 passengers a day and at present it is not unusual to transport on the enlarged system 2,500,000 subway passengers and more than 1,000,000 elevated passengers each day.

Mr. Hedley also reviewed very briefly some of the aspects of the technical and physical operation of the system. He told about the company's own power stations, the emergency connection with the system of the New York Edison Company in order to insure uninterrupted service, the signal system on both the subway and the elevated, methods of track protection at curves, the inspection of system of track to guard against possible track failures,

the blockade alarm system so as to inform operators of any tie-up and the ventilating equipment.

He also told about the work of the company in its effort to speed up the movement of trains, showing that with seven motor cars to a standard train a capacity of 4,000 hp. could be developed at 1.7 m.p.h.p.s. acceleration, with the motorman notching up from the off to full, or parallel position, at one turn of the controller handle. The retardation problem was not so simple, but with the electric pneumatic brakes applied to all the cars at one time, a constant pressure in retardation of 2 m.p.h.p.s. had been attained, or about 40 per cent better than on the steam railroads. He then went into the subject of inspection of cars. This is done on a mileage basis of 1,200 miles. A particularly complete record of work on the cars is kept and the men responsible for the defects are disciplined if the cars do not make the allotted 1,200 miles. Many of these practices have been described before in the *ELECTRIC RAILWAY JOURNAL*.

The other speaker of the evening was George S. Silzer, formerly Governor of New Jersey and now chairman of the New York Port Authority. This board was created by an act passed in 1921. It was born out of two circumstances, the fact that New Jersey wanted freight differentials and that the breaking out of the war had brought out the need for a centralized authority to handle traffic in the port of New York. Within the province of the board is 180 miles of shore line, over which territory there are 9,000,000 people. Before the creation of the Port Authority there was no central body to deal with problems of the port. Each interest dealt with matters in his own way. There was no collective mind to study questions that arose.

Mr. Silzer went over the ground very thoroughly. He told about the bridge projects of the board, linking Staten Island and New Jersey, and the proposed crossing of the Hudson River by bridge from Edgewater to uptown New York. He also told about the proposed terminal railroad to intersect all of the present existing carriers in the metropolitan district and disclosed some of the features of the central warehousing plan by which shippers will transport their merchandise to central distributing stations, from which the goods will be reassigned to the particular carrier over whose lines the shipment is intended to be transported.

He spoke about the increase in the interstate bus traffic and indicated the extent to which this traffic would be increased under the stimulus of direct entrance into the city of New York over the proposed new bridges and through the vehicular tunnel under the Hudson

COMING MEETINGS

OF

Electric Railway and Allied Associations

Jan. 6-7—Midwest Electric Railway Association, midwinter meeting, Mayo Hotel, Tulsa, Okla.

Jan. 7—American Electric Railway Association, Metropolitan Section, Engineering Societies Building, New York City, 8 p.m.

Jan. 10-14—American Road Builders' Association, convention and road show, Coliseum, Chicago, Ill.

Jan. 18-19—Kentucky Association of Public Utilities, annual convention, Brown Hotel, Louisville, Ky.

Jan. 25—New York Electric Railway Association, winter meeting, Hotel Commodore, New York City.

Jan. 26-28—Association of Equipment Men—Southern Properties—Memphis, Tenn.

Feb. 3-4—Central Electric Railway Association, winter meeting, Toledo, O., Commodore Perry Hotel.

Feb. 7-10—American Institute Electrical Engineers, annual convention, Engineering Societies Building, New York City.

Oct. 3-7, 1927—American Electric Railway Association, annual convention, Public Auditorium, Cleveland, Ohio.

River. He said that an orderly program for the benefit of the port of New York was now under way and he wondered how long it would be before the people of New York took up the question of local traffic and made a real effort to try to solve it. While he did not say so directly, the tenor of his remarks indicated that Mr. Silzer felt that it would probably be necessary for the Port of New York Authority still further to co-ordinate its activities in the handling of passengers and freight with the activities of the existing carriers in the city of New York.

There was a goodly sprinkling of ladies present at the meeting and despite the technical nature of some of the facts the audience was unusually attentive and apparently very appreciative of the remarks of both speakers.

Automatic and Manually Operated Track Switches*

BY P. BATAILLE
Liège Tramways
and

K. STOFFELS
Amsterdam Municipal Tramways

THIS discussion is a continuation of the report of the committee on the same subject at the last convention. Replies from 32 companies indicate that seventeen of them use electric switches and have about 300 in use, and that these switches are taking the place of track switches mechanically operated.

Electric switches are of two kinds, high voltage, or those operated from the trolley circuit, and low voltage, or those in which one rail of the track is insulated and the switch is operated by the current after it has passed through the motors on the cars. The Weenan, Collins, Siemens, and I.E.M. are of the former type and the Bataille, Oerlikon and A.E.G. of the latter type. In the replies to the association questionnaire, emphasis was laid by a number of companies on the need for regular inspection and overhaul of switches. The time spent in their repair per year is estimated by different tramways as follows: Amsterdam, 62 hours; Rotterdam, 52 hours; Zürich, 60 hours; Liège, 70 hours. The railway system reporting the largest number of electrically operated track switches in use was the Amsterdam Tramways with 86.

The committee estimates that if there is a gain of one-half minute in the operation of the car over a switch through the use of electric operation it would pay a railway company to install electric operation where the switch is turned more than twice a day. This conclusion is reached as follows:

Operating expenses per car-day on most railways averages 450 francs, and this sum is equivalent to $\frac{1}{2}$ franc per minute. Then if an electrically operated track switch saves $\frac{1}{2}$ minute for each operation it would have to be used only twice to effect a saving of $\frac{1}{2}$ franc a day. This sum is the average cost of electric switch maintenance, as determined by replies to the data sheet.

*Abstract of paper presented at the biennial meeting of Union Internationale de Tramways, de Chemins de Fer d'Intérêt Local et de Transports Publics Automobiles, Barcelona, Spain, Oct. 10-16, 1926.

Possibility of an Index to Determine the Proper Tramway Fare†

BY R. HAERENS
Manager Compagnie Belge des Chemins de fer Réunis,
Brussels, Belgium

PRACTICALLY all of the electric railway systems in Europe have been obliged to increase their fares for a number of causes, including the following: A considerable increase in wages due to labor legislation in favor of an eight-hour day; a large increase in the cost of labor and material since the close of the war, and marked reductions in the purchasing power of money. To these reasons are added, in the case of countries with a depreciated currency, the effects of the lower exchange rate.

The result of these conditions has been a practical stoppage in the development of the tramway industry and has suggested the advantages, if possible, of some basis for a sliding scale for fares based on the conditions which experience has shown affect electric railway enterprises. This means, of course, in the case of private companies, that some arrangement must be made with the controlling authorities for a modification of the franchise conditions. Incidentally, it might be said that municipal tramway systems are the exception rather than the rule in the cities of western continental Europe.

THREE PRINCIPLES RECOGNIZED IN TRAMWAY FRANCHISES

In the grant of tramway franchises in the past, it has been the practice in western Europe for both parties to recognize three definite principles:

1. During the early part of the life of the franchise the company will be building up its traffic and that it depends on the earnings of the latter part of the franchise period to make up the losses incurred during its early life. In consequence, where the franchise includes a clause permitting the municipality to take over the line, the basis during the early part of the franchise is not the earnings of the property, but the investment plus a certain per cent as a bonus.

2. The average franchise usually also includes a statement of the amount of taxes to be paid and often also one specifying a minimum for wages and a maximum for hours of work for the employees.

3. The third point often embodied in a railway franchise is that the municipality reserves the right to share in any very large returns made by the enterprise, though it declines in any way to participate in any loss.

Having considered the principles embodied in tramway franchises in the past, an effort will be made to determine whether it is possible to draft an additional clause by which the rate of fare would vary in proper ratio with changes in wages paid, legal hours of work, cost of power and other operat-

ing expenses. A formula to cover the two major factors mentioned will first be considered.

Let:

S = the hourly wage rate, which will be assumed to be 3 francs

E = the cost of electrical energy, which will be assumed to be 0.3 francs per kilowatt-hour

Assume, also, the total wage account = 10,000,000 francs per year and that the total expenses for electrical energy = 1,500,000 francs

Then the fare index (I) to cover these two major items will be:

$$I = S + 1.5 E$$

In this formula the constant 1.5 has been introduced as a weighting factor to give the two items of expense their proper value. Thus:

$$\frac{S}{1.5E} = \frac{3}{0.3 \times 1.5} = \frac{3}{0.45} = \frac{10,000,000}{1,500,000}$$

In other words, the proportion is equal to that of the total itemized expenses already mentioned, or 10,000,000 francs and 1,500,000 francs.

This formula leaves out of consideration the cost of other materials, but experience has shown that they vary practically with hourly wages and electrical energy, so they can be neglected, though where motor buses are used, it would be useful to include a third term based on the cost of rubber tires.

Still another factor is increased taxes. The importance of this has been shown in some cases recently and the franchise should be made to read that the fare be increased in accordance with the increased taxes.

It is true operating expenses are not in absolute ratio with the items of cost mentioned. Thus they are affected by the scheduled rate of speed, extent of car loading and some other factors. The formula mentioned above has therefore its limits. Inclusion in the franchise of a clause covering it will help, but there should also be a general clause granting right of revision of terms to the operating company in case the proposed index does not entirely cover the situation.

American Economic Association to Discuss Regulation

EFFECTIVE public utility regulation will be the subject of one of the most important discussions at the 39th annual meeting of the American Economic Association, to be held at St. Louis, Mo., Dec. 28-31. This will be in the form of a round-table conference in charge of Dr. John Bauer of the American Public Utilities Bureau. Others on the program are Profs. Robert L. Hale and J. C. Bonbright, Columbia University; H. G. Brown, University of Missouri; Martin G. Glaeser, University of Wisconsin, and C. E. McNeill, University of Nebraska.

†Abstract of paper presented at the biennial meeting of Union Internationale de Tramways, de Chemins de Fer d'Intérêt Local et de Transports Publics Automobiles, Barcelona, Spain, Oct. 10-16, 1926.

New Englanders Discuss Snow Fighting

SNOW FIGHTING formed the main topic of the regular monthly meeting of the New England Street Railway Club held Dec. 2 at the Copley Plaza Hotel, Boston, the program being based on the presentation of four practical papers by H. M. Flanders, general manager Springfield Street Railway; N. J. Scott, manager Hartford division the Connecticut Company; W. C. Bolt, superintendent of rolling stock and shops Eastern Massachusetts Street Railway, and E. L. Lockman, assistant engineer of surface lines Boston Elevated Railway. An extended discussion followed the reading of the papers.

President Fred D. Gordon occupied the chair, and after the usual dinner in the evening Albert A. Northrop of Stone & Webster, Inc., Boston, gave an interesting talk on "Power," illustrated by motion picture films. Dean Wallace B. Donham of the Harvard Graduate School of Business Administration, who had been scheduled to address the club on "Business Administration in Street Railway Management," was unable to be present on account of illness. Abstracts of the papers on snow fighting and the discussion that followed will be published in an early issue of this paper.

American Association News

Parking Unanimously Condemned

Police, Railway and Mercantile Interests at Metropolitan Section Meeting Agree on Causes of Congestion in New York

GENERAL agreement concerning the causes of traffic congestion in the streets of New York was voiced by speakers at a meeting of the Metropolitan Section, A.E.R.A., held on Dec. 3 at the Engineering Societies' Building. The viewpoint of the Police Department was explained by William A. Coleman, deputy chief inspector in charge of traffic. W. G. Strait, vice-president New York Railways, presented the operators' side of the case and F. C. Fox, assistant to the president A. I. Namm Company, explained that of the retail merchant. Despite a brisk snowstorm the meeting was well attended.

Inspector Coleman said frankly that parking is the worst problem which faces the traffic division of the Police Department. He called attention to the excellent results accomplished by parking restrictions originally imposed during the subway strike and recently made permanent. An abstract of his talk appears on this page.

The important part played by the surface car and the bus in New York City transportation was brought out by Mr. Strait. He quoted figures showing that the surface car is not of itself a slow vehicle, but is well able to main-

tain adequate speed when not unduly hampered by other traffic. Mr. Strait's paper appears in abstract elsewhere.

Keen appreciation of the seriousness of the traffic problem was shown in the talk by Mr. Fox. He said that the merchants are partly responsible for the creation of congestion. They have established many large stores in a comparatively small shopping district and they are now beginning to feel the adverse effects of this policy. On account of the difficulty of reaching these downtown stores there is a growing tendency for people to make their purchases at neighborhood stores. He expressed apprehension that this process of decentralization would continue rapidly unless parking was restricted, particularly on streets where car lines operate. In his opinion there are marked economic advantages for the customer in shopping at a large store, and these will be lost if the difficulty of reaching the downtown stores causes people to do their buying locally. Mr. Fox spoke of an insidious propaganda

being put forth against the surface car in favor of the bus. He thought that if buses were substituted for cars the public would soon find that the remedy was worse than the disease. An abstract of the talk by Mr. Fox will appear in a future issue.

Prior to the discussion of traffic congestion, A. L. Hodges, secretary Brooklyn City Railroad, gave an interesting account of the recent congress of the National Safety Council and urged all railway men to take a lively interest in the work of this body. The concluding speaker on the program was William S. Hamilton, assistant to the superintendent of transportation Brooklyn City Railroad, who told of changes in operation made with a view to relieving congestion. J. H. Hanna, who was present as a guest, spoke a few words of greeting. Motion pictures taken at the summer meeting of the New York Electric Railway Association at Bluff Point and of the outing of the New York Railroad Club at Pelham Bay Park were shown.

Police Department Finds Parking Most Frequent Cause of Delay*

By W. A. COLEMAN

Deputy Chief Inspector Police Department,
New York City

FROM my experience in the Traffic Division, it is my opinion that the greatest obstruction and the most frequent cause of delay to the free movement of traffic is inconsiderate parking. How any citizen who has any regard for the rights of others can drive up with his car in the early morning into a narrow street, possibly with a street car line running through, or on some other busy thoroughfare in a congested business section, and lock it and leave it for six, seven or eight hours, as is often the case, is something I cannot understand and certainly disapprove of. Ten chances to one, whenever or wherever traffic conditions are discussed, you will find this man to be loudest in his denunciation of traffic congestion and asking why the hell something isn't done about it.

It is impossible, with the limited force we have, to stop all unlawful parking. Properly to serve a summons on these long-time parkers means that a patrolman must watch and wait six or seven hours until the owner of the car returns to take it away. This is a waste of police time, but is necessary in order to obtain a conviction in court.

During the recent subway strike the value of preventing parking was amply demonstrated by the emergency regulation which was put into effect at that time and has since been made permanent, prohibiting parking on the most important north and south bound avenues below 59th Street from 7 a.m. to 10 a.m. and from 4 p.m. to 7 p.m. The effect was almost instantaneous. We increased the width of the roadway on these avenues at least 15 ft. over night.

*Abstract of a paper presented at a meeting of the Metropolitan Section, A.E.R.A., Dec. 3, 1926.

The day on which the strike went into effect traffic practically was at a standstill all of that day. It was impossible to make any time getting up or down town. On the following day, when the emergency regulation went into effect, one could hardly believe such a change was possible; traffic flowed so smoothly there was no congestion; it looked to me like a holiday or Sunday in New York. It proved beyond any doubt that one of the most helpful remedies for relief of our traffic congestion is to put a no parking regulation into effect.

Another obstruction to the movement of traffic is the street cars. Take, for instance, Madison Avenue, where a light control system is in operation. For two minutes traffic is permitted to proceed north and south and one minute east and west. When the green light appears the automobile and the street car proceed; the automobile should in that two minutes cover from twelve to fourteen blocks, but owing to the limited roadway space and parked cars on every block the automobile cannot pass the street car between blocks, and as the street car has to stop every block or two for twenty or thirty seconds at least to permit passengers to alight or to get aboard, the automobile has to stop also. The two minutes allowed very soon expires and the automobile rarely travels more than four or five blocks during the two-minute interval.

Another cause of delay to faster moving traffic is the horse-drawn vehicle. In some cities it is not permitted in certain congested sections. I doubt if any such regulations could be put into effect in this city, but I do believe that considerable of the trucking now being done in the daytime will have to

be done at night, also that loading and unloading from the side of a vehicle will be made compulsory. If this was done another great obstruction to moving traffic would be removed. Another help would be to have some zoning regulation for business districts. In some buildings in the thirties there is a business conducted on every floor, and the backed-in vehicles completely tie up the street all day.

This congested area extends from 30th to 42d Street, from Fourth to Eighth Avenue. It often takes from 30 to 40 minutes to get across town through some of these streets. We are going to put some restrictive regulation in effect here. We may select two or more crosstown streets in this section and prohibit parking entirely, confine it to one side, or limit parking to twenty minutes, and watch the effect. We have not decided which street to try it out on or when it will be done.

We must, if we are going to permit this constant increase in vehicles, do

something to increase the width of our roadways if we expect to keep traffic moving. I think we must eventually double deck some of our streets; we can widen others to at least 34 ft. by reducing the sidewalk widths. Where new roadways are being built and the space is available a width of 80 ft. is the least that should be considered as practicable.

The total registration of motor vehicles in the five boroughs up to and including Nov. 1, 1926, shows there are 589,578 motor vehicles in this city alone; to this must be added thousands of vehicles that come here daily from other parts of the country. How are we going to accommodate this enormous traffic growth to our already overburdened streets is a problem that I am facing with some apprehension, and while I am no alarmist, it looks to me, unless help comes from some source, and comes quickly, we will see traffic completely tied up in certain parts of this city.

Street Cars Travel as Fast as the Traffic*

BY W. G. STRAIT
Vice-President New York Railways

EVERY one is willing to suggest means to solve the traffic problem of the future, but so great is our national reverence for the automobile that few dare to propose a solution for the problem as it now exists. In an interesting interview on this subject, Thomas A. Edison takes a look ahead and tells us that the construction of streets at different levels and the perfection of a helicopter which will enable airplanes to rise and descend vertically will eventually cure our traffic ills. This ought to be good news for the New Yorker of 2026, but it affords small comfort to a citizen of today, marooned in the safety zone at Fifth Avenue and 42d Street. Until we can divert our present traffic to air routes, something must be done to promote a more efficient use of these lanes of travel which are now available. As a matter of simple justice as well as common sense, the rights and well-being of the greatest number of people affected by traffic strangulation ought to receive first consideration.

Surface cars and buses carry 40 per cent of the total number of passengers carried on all transportation lines in Greater New York. Two out of every five residents of New York City, or 1,200,000,000 passengers a year, are subjected to unnecessary inconvenience, delay and annoyance in order that a few thousand owners of automobiles may enjoy the privilege of storing their cars on public thoroughfares—on the property of the public, whose progress to and from their homes is thus retarded.

If such a large proportion of the people of our city use street cars under the present unfavorable conditions surrounding surface travel, how many would use them were adequate traffic restrictions put into effect? Is it not

reasonable to assume that such restrictions would bring about a considerable measure of relief from the overcrowding on subway and elevated lines?

Every surface system in the city is equipped to handle a much greater volume of business than it is now able to take care of. With a speeding up of traffic these systems would become important factors in solving the transportation problem. A great deal of short-haul traffic and not a little long-haul traffic have been diverted from the surface carriers to subway and elevated lines, to taxicabs and private automobiles, not because of any failure on the part of the surface lines to provide service, but solely because of conditions beyond their control.

Street cars can travel as fast as the traffic. To prove it I need only give the result of a series of speed checks recently taken on certain lines of the New York Railways system which are most affected by congestion. On Broadway, for example, the schedule running time from 59th Street to South Ferry is 46½ minutes. A southbound car, leaving the northern terminus at 7 a.m., arrived at South Ferry 33½ minutes later, thirteen minutes under schedule. Starting north at 7:38, it arrived at 59th Street in 47½ minutes, one minute over schedule time. Now look at the other side of the picture. A southbound trip, commencing at 3:12 p.m., required 65½ minutes; a northbound trip, starting at 2:04 p.m., required 67 minutes, and another northbound trip, at 4:18 p.m., required 73 minutes to complete. But at 6:25 p.m., when traffic had thinned out and the parked vehicles had disappeared, the same car and crew made the trip in 33 minutes, 13½ minutes under schedule.

It was the same story elsewhere. On the Seventh Avenue-Delancey Street line, where the schedule running time is twenty minutes, the time of trips varied from eighteen minutes in the early

morning to 52 minutes in the late afternoon. On Sixth Avenue, with a schedule time of 22½ minutes, an early morning run was completed in 15½ minutes and a late afternoon trip in 39 minutes.

I could furnish similar evidence from each of our eleven lines if it were necessary, but you, as practical transportation men, know as well as I that traffic is the controlling factor in determining how much time is required to carry passengers to their destinations. I might say, incidentally, that the crews on the cars that were checked had no knowledge that a check was being made.

So long as the rights of the traveling public are subordinated to the comfort and convenience of owners of private motor cars, just so long will New York's traffic problem remain unsolved. What it is costing the city in lost time and energy, and in dollars and cents, is beyond computation. The worst of it is that the situation is becoming worse, not only monthly, but daily.

There are 400,000 passenger automobiles registered in Greater New York, to say nothing of the New Jersey, Long Island and Westchester suburbs. If parked close together, they would occupy a street extending from City Hall to Omaha, Neb., but most of them seem to be trying to find parking space south of 59th Street. That is why the Manhattan Surface Line Operators' Traffic Committee seeks the abolition of parking in that section.

Every well-informed, unbiased student of the traffic problem realizes that the remedy lies in discouraging the use in congested sections of the inefficient carrier and encouraging the efficient carrier—the one which transports the most people while utilizing the least amount of roadway space. At present the reverse of this principle is being applied.

MUST CONVINCE THE MERCHANTS

Parking prohibitions will not only have the effect of opening up new lanes of travel, but will also discourage the use of the inefficient carrier—the one hauling, on an average, 1½ passengers—in the more congested sections, where these prohibitions are applied.

The only reason why practically unrestricted parking is permitted is that certain shortsighted merchants have been able to exert a potent influence in favor of the practice. In their eagerness to encourage the parking of cars in front of their stores they forget that they are making these stores inaccessible to other potential customers who travel in private cars, in taxicabs, in street cars and in buses.

The practical transportation men of New York City must combat this fallacious view. If possible, they must convince the merchants of the desirability of prohibiting unnecessary parking, but whether or not they can do this they must convince the proper authorities that it ought to be done because public interest demands it. Every legitimate influence that can be exerted upon public opinion and city officials ought to be exerted to bring about the desired result. Each of us can help as individuals and also as representatives of a vital industry. We owe this much to

*Abstract of a paper presented at a meeting of the Metropolitan Section, A.E.R.A., Dec. 3, 1926.

ourselves, to the thousands of people who constitute the ownership of these properties and to our patrons.

Members Elected

MEMBERSHIP was voted to two operating electric railway companies, eleven manufacturing companies and six individuals at the meeting of the executive committee of the American Electric Railway Association held Nov. 19. Following is a list of the new company members:

OPERATING COMPANIES

Chicago, South Shore & South Bend Railroad, Michigan City, Ind.
Newport & Providence Railway, Newport, R. I.

MANUFACTURER COMPANIES

Ferodo and Asbestos Incorporated, New Brunswick, N. J.
Fremont Metal Body Company, Fremont, Ohio.
Hunt Spiller Manufacturing Corporation, South Boston, Mass.
Kelly-Springfield Tire Company, New York, N. Y.
McJunkin Advertising Company, Chicago, Ill.
Meyer & Wenthe, Chicago, Ill.
The New Departure Manufacturing Company, Bristol, Conn.
The Northern Granite & Stone Company, Cleveland, Ohio.
Phillips Petroleum Company, Bartlesville, Okla.
The Seiberling Rubber Company, Akron, Ohio.
Truscon Steel Company, Youngstown, Ohio.

Power Transmission and Distribution

ORGANIZATION of sub-committees and outlining of work to be undertaken filled a two-day meeting of the power transmission and distribution committee of the Engineering Association held in New York Dec. 2 and 3. Members present were F. McVittie, chairman; J. W. Allen, M. W. Cooke, J. H. Drew, S. S. Hertz, A. J. Klatte, H. S. Murphy, J. F. Neild, W. J. Quinn, M. B. Rosevear, W. Schaake, A. Schlesinger, D. L. Smith and R. E. Wade. J. C. Daiman represented W. H. Bassett and E. D. O'Neill represented C. L. Hancock.

It was decided to hold the next meeting of the committee in Chicago, March 7 and 8. In order to conform with the action taken at the last convention regarding specifications for steel tubular poles, it was agreed to remove from specification D202-16 all reference to tubular steel poles beginning on page 332 of the Manual, including the text and tables on pages 342 and 343. A paragraph was agreed upon which is to be inserted in place of the matter removed. It was also agreed to remove section D202-25 from the Manual and include the specifications as approved by the American Engineering Standards Committee in place of it.

Improvement of the wireograph, which is used for making measurements of trolley wire, was discussed and it was decided that the chairman of sub-committee No. 3 should place before the Bureau of Standards and also before several universities the question of making an analysis of the principles of this instrument to include suggestions for correcting errors which now exist.

The question of pole reinforcement as a means of avoiding replacement of depreciated poles was discussed and

results of experiments being made in Chicago and on the Third Avenue Railway in New York were given.

Work of the various sub-committees was started by meetings which were held Dec. 3. Sub-committee No. 1, which is to review existing Manual sections, went over all the present sections relating to power transmission and distribution and decided on the ones which would receive detailed consideration. The sub-committee on this subject consists of J. W. Allen, chairman; J. H. Drew, S. S. Hertz, K. J. Keith, John Leisenring, W. J. Quinn, M. B. Rosevear, W. Schaake, A. Schlesinger and R. E. Wade.

Study of specifications for materials used in catenary construction will be continued by sub-committee No. 2. Recommendations of the 1926 committee were gone over in detail and many points were cleared up. The sub-committee on this subject consists of D. L. Smith, chairman; S. H. Anderson, W. H. Bassett, J. H. Drew, S. S. Hertz, John Leisenring, M. B. Rosevear, W. Schaake, A. Schlesinger and R. E. Wade.

Trolley wire wear and breaks will be studied further by sub-committee No. 3, which will endeavor to clear up disputed points regarding the accuracy of the wireograph. The sub-committee consists of H. S. Murphy, chairman; J. W. Allen, S. H. Anderson, W. H. Bassett, M. W. Cooke, J. H. Drew, C. L. Hancock, A. J. Klatte, J. F. Neild, M. B. Rosevear and G. F. Wennagel.

Sub-committee No. 4 will continue to confer with the American Society for Testing Materials in an effort to improve the specifications for bronze trolley wire. Discussion of this subject showed that there is a tendency for closer agreement on the twist test which has been under discussion. The personnel of the sub-committee is: H. S. Murphy, chairman; J. W. Allen, W. H. Bassett, M. W. Cooke, C. L. Hancock, A. J. Klatte, J. F. Neild, M. B. Rosevear and G. F. Wennagel.

Investigation of radio interference will be continued by sub-committee No. 5 and this committee will be very glad to receive any reports of experience and conditions from any member of the association who is having problems to solve. The sub-committee includes W. J. Quinn, chairman; S. H. Anderson and D. D. Ewing.

Inductive co-ordination will be studied and sub-committee No. 6 will endeavor to maintain contact with the American committee on inductive co-ordination. The sub-committee on this includes J. F. Neild, chairman, together with D. D. Ewing and A. Schlesinger.

A new subject is being considered by sub-committee No. 7. This is a layout designed for the distribution system of automatic substations. It was agreed that information should be gathered to form a definite basis for the development of such a system. This information will be obtained from the principal manufacturers, together with engineers who have automatic substations. The sub-committee consists of G. F. Wennagel, chairman; D. D. Ewing, J. Leisenring, W. Schaake, A. Schlesinger, D. L. Smith and R. E. Wade.

The advisability and possibility of

establishing a standard by which various methods of operating and maintaining overhead lines can be compared was considered by sub-committee No. 8. Discussion brought out that many variables must be considered and the sub-committee will try to formulate some recommendations to take care of various conditions. The sub-committee includes M. W. Cooke, chairman; K. J. Keith, A. J. Klatte, H. S. Murphy, J. F. Neild and W. J. Quinn.

Standardization of trolley wire reels is a new subject being undertaken by sub-committee No. 9. Discussion of this showed that all felt very definite recommendations should be made. Designs for standard reels will be worked out and will be submitted to all manufacturers of trolley wire in an endeavor to secure agreement. The sub-committee includes J. F. Neild, chairman; W. H. Bassett, C. L. Hancock, S. S. Hertz, K. J. Keith, A. J. Klatte and D. L. Smith.

Wood Preservation

SUB-COMMITTEE assignments and subjects to be studied during the present year were discussed at a meeting of the committee on wood preservation held at New York on Dec. 8, 1926. It was decided to drop some of the topics considered by the committee last year and to concentrate on others. A special attempt will be made to present data in the committee's report showing the economic advantages of treating timber. Those present were: C. A. Smith, chairman; A. P. Way, W. L. Harwood, E. F. Hartman, E. H. Swayze, W. H. Fulweiler and R. H. White, Jr.

Manufacturers' Committee to Expand Activity

IN A MEETING of the committee on co-operation of manufacturers held at association headquarters on Dec. 6 suggestions for broadening the scope of the committee's activity were made. During recent years, this committee's work has consisted principally of co-operation with the publicity committee for the purpose of enlisting the support of manufacturers in presenting the railway situation to the public.

The plan for broadening the committee's functions would extend its activities to other things. The thought was expressed that this might ultimately result in making the committee a clearing house for presenting to the executive committee the collective views of manufacturers. Suggestions made in a letter by M. B. Lambert, transportation sales manager Westinghouse Electric & Manufacturing Company, for setting up a regional organization of the committee which could be made the means of stimulating interest on the part of all manufacturer representatives in the subject of improved equipment were discussed at length. Suggested names for such regional appointments were made to Chairman Wickwire. Other activities in which such a regional organization would make possible greater co-operation by manufacturers in promoting the interests of the electric railway industry were outlined and discussed.

The News of the Industry

Temporary Extension on the Way

Recent Moves at Chicago Indicate Respite for Surface Lines—Rumors of Bus Service with 4,300 Vehicles

Because it is regarded as the only temporary solution of the traction problem possible; because it would give the Legislature time to pass laws permitting the incorporation of such features as terminable permits and unified transit in the new franchises, and because it would protect the interests of the city during the impending receivership, the transportation committee of Council of Chicago voted almost unanimously on Dec. 8 to recommend to the Council that it extend the Surface Lines franchises for six months until July 1, 1927. The lone Alderman who protested said that the city should not put itself on record before the companies signify whether or not they will accept the offer.

A resolution outlining the terms of such a grant had been previously prepared by Corporation Counsel Francis X. Busch at the instance of the local transportation committee and Mayor William E. Dever, who first urged the extension two weeks ago. In commenting on the proposal Mr. Busch asserted that it was unlikely the grant would prevent a receivership.

CITY-WIDE BUS PROPOSAL SUBMITTED

Rumors that the Chicago Motor Coach Company was prepared to offer a city-wide bus service to the city were set at rest on Dec. 8. On that date J. A. Ritchie, president of the company, addressed to Mayor Dever and the Council a letter in which he said that "we propose giving Chicago a complete installation of modern double-deck motor coaches serving not only the people now served by the Surface Lines, but extending the installation to localities at present without any service." He said the art of motor coach design and construction has developed to the point where mass transportation can be adequately handled by the motor coach.

According to him the modern large capacity coach is a more efficient carrier than the street car, due to the marked improvement in construction in recent years. On the other hand "there has been little progress in recent years in street railway systems." His company proposed to furnish "a sufficient number of motor coaches so that during rush hours there would be available 290,000 seats as compared with 156,000 now provided by the Surface Lines."

The total capital investment for the proposed city-wide motor coach operation in Chicago is estimated by him at less than one-half of the present value of the Surface Lines as reported by the Board of Supervising Engineer

The length of the average ride per passenger on the Surface Lines in Chicago, Mr. Ritchie says, is about 4 miles. On the present motor coach system, operating largely on the boulevards, the average ride per passenger is about 6 miles.

Mr. Ritchie expressed the opinion that notwithstanding the case now pending in the Supreme Court of Illinois between the city and his company, involving certain legal questions, and having in mind the importance to the city of Chicago of an early settlement of its surface transportation problem, an agreement could be entered into between his company and the city which would bring about a prompt solution of the problem. He said the agreement would be binding on the city and his company no matter which side is successful in the pending litigation.

Mr. Ritchie says the interests he represents desire to confer with the city authorities to work out a plan which will meet with public favor. According to him the subject of fares, period of contract, compensation for the use of the streets, etc., have all received careful attention by his company.

\$20,000,000 Interurban Extension Authorized

Immediate construction of a connecting link of the Piedmont & Northern Railway between Spartanburg, S. C., and Gastonia, N. C., a distance of 55 miles, was authorized by stockholders of the railway at a meeting in Greenville, S. C., on Dec. 8. The action of the stockholders ratified a proposal of the board of directors made about a month ago. A resolution adopted by the stockholders also authorized the directors to proceed as they see fit with extension of the Piedmont & Northern lines north from Charlotte, N. C., to Durham, N. C., with such branch lines and along such route as the directors may see fit.

This is a distance of about 135 miles, and when this second addition is completed the rich cotton belt of South Carolina and the tobacco growing section of North Carolina will be connected with a continuous electric railway. Extension of the Piedmont & Northern lines, which will ultimately represent an expenditure of about \$15,000,000 or \$20,000,000, will be financed by stock sales and bond issues according to the judgment of the board of directors. With this action of the stockholders in ratifying the proposal the matter now reverts back to the directors, who are instructed to enter into any contracts or agreements that they deem advisable in pushing to completion the extension.

Work on the extension of tracks from Spartanburg to Gastonia will begin as soon as legal and financial details can

be worked out so that the tracks will be ready for the operation of trains within about one year.

L. J. DeLamarier Nominated for Civic Prize

Louis J. DeLamarier, vice-president and general manager of the Grand Rapids Railway, Grand Rapids, Mich., has been named by the Association of Commerce of that city as candidate for the \$1,000 award offered by the Harmon Foundation of New York to the person responsible for the most outstanding civic achievement for the year.

Mr. DeLamarier merits consideration for the honor because of his contribution to the progress of railway service with the new cars that have brought Grand Rapids renown in that field.

Inquiries indicating interest in the Grand Rapids treatment of its railway problem have come from all over the country, says Lee H. Bierce, secretary of the Association of Commerce.

The chairman of the award jury is Julian W. Mack, judge of the United States District Court at New York. Other members of the jury are Jane Addams of Hull House, Chicago; Will W. Alexander, director of the Commission on Inter-Racial Co-operation, Atlanta; Mary S. Gibson, Los Angeles, and Rev. John A. Ryan, director of the National Catholic Welfare Council, Washington, D. C.

The award is not competitive in a literal sense. While nominations are invited, the judges are not restricted to a choice from among nominees.

New Corporation Would Operate in Michigan

The Rapid Transit Corporation of America, incorporated under the laws of the State of Delaware, which has taken over the Michigan Elevated Railway Corporation and the Detroit Elevated Corporation, still in the promotion stage, has applied to the Michigan Public Utilities Commission for permission to do business in Michigan.

It is proposed to construct a monorail line from South Park, near Port Huron, Mich., to Detroit. Officials of the company announce that financing of the line is assured.

Officers of the corporation include C. M. Goodrich, K. Vedder, William O. Fitzgerald, George A. Schwab, Dr. J. C. Walker and Fred Rohnert.

Labert St. Clair Recovering

Labert St. Clair, director advertising section of the American Electric Railway Association, is convalescing at his home in Rye, N. Y., from the effects of an operation to which he submitted shortly after his return to New York from the convention at Cleveland.

St. Petersburg Municipal Line Goes to 7-Cent Fare

Seven cents is now being charged in St. Petersburg, Fla., on the lines of the Municipal Railway of St. Petersburg. The old fare was 5 cents. The increase, effective on Dec. 1, was recommended by R. E. Ludwig, director of public utilities, and was approved by the City Commission.

Steady decreases in the total receipts from passengers were ascribed as the main reason for a higher fare. Railway receipts in October fell off 10 per cent compared with a similar month last year, and November, according to Director Ludwig, is 15 per cent below November, 1925. In addition, the company has been called upon to pay for large improvements out of the operating funds.

With a fare of 7 cents, sixteen car tokens are to be sold for \$1 and the special rates for school children will remain. The two-zone system within the city has been abandoned, reducing the regular fare to the Jungle and Shore Acres from 10 to 7 cents. Although the increased rate applies only to St. Petersburg, it was intimated that the question of an increase from 10 to 14 cents for Gulfport would be taken up with the Town Council of Gulfport and the Florida Railroad Commission.

Commissioner Charles L. Snyder said that in his opinion the municipality should not operate a public utility at a loss. He explained that the city should not charge taxpayers who do not ride the street cars for the deficit caused by the riding public. He said the increased fare was a temporary measure taken to tide the municipal railway over until the city was relieved of the extra burden of expenditures brought about this year by extensions to the railway and losses suffered by operation of a municipal bus line. City Commissioner Serviss explained that buses were now paying their own way.

Boston Committee Contemplates Extensions

A special commission, created by the Legislature last year, has made several recommendations to the new Legislature regarding rapid transit in Boston. These include an extension of the rapid transit system from Governor Square to permit Boylston Street trains to go farther west; a subway station at the corner of Charles and Cambridge Streets; an extension of the East Boston tunnel again, running it from Maverick Square in East Boston out to Day Square, and an extension of the Elevated service beyond the Everett station.

The commission reports against the proposition to scrap the Boston Elevated structure in Charlestown and in Washington Street, Boston, as unwise and uneconomical, but it concludes that the city of Boston might buy the elevated structure. Such purchase would not be different from the state's purchase of the Cambridge subway, and the ownership of it by the city would be like its ownership of the subways and tunnels in Boston. It would relieve the Elevated of a burden and permit of

the construction of other improvements when needed. If the elevated structure were owned by the city and a rental of 6 per cent were charged the railway, the annual rent would amount to \$1,800,000 and the purchase price load would be paid from the sinking fund. This would be about \$27,000,000. If the purchase money cost the city 4 per cent to borrow, the debt would be paid in 27 years, from the sinking fund accumulation.

The commission which makes these recommendations is composed of Chairman Attwill of the Public Utilities Commission, Stanley R. Miller of the board of trustees of the Boston Elevated Railway and Col. Thomas H. Sullivan, chairman of the Boston Transit Commission.

Wage Increase in Pittsburgh Proposed

The trainmen and the management of the Pittsburgh Railways, Pittsburgh, Pa., have approached the Traction Conference Board with a view to increasing the rate of pay of trainmen 1½ cents per hour, effective Jan. 1, 1927. It is believed that although the present agreement between the company and the trainmen does not expire until May 1, 1928, this move is economically sound because of the splendid co-operation rendered to the company and the public during the past year, and because of the many economies the men instituted or aided to put into effect.

A poll of the members of the Traction Conference Board indicates that they would agree to the proposition, but action cannot be taken officially until the railway budget for 1927 is presented.

Wheeling Favors Revised Franchise

The proposed revised franchise of the Wheeling Traction Company, Wheeling, W. Va., has been generally received with favor by representative citizens as a result of a joint citizen-Council meeting. The suggestions were also favorably received by A. C. Spurr, general manager of the company. He informed the Council and the citizens that the revision was not being sought because of the assumed operation of the Mozart Park line but because it was necessary to ask for relief; that the company was operating in Wheeling under antiquated franchises, and that many cities and a few states had through legislation relieved the railways of obligations similar to those that exist in Wheeling.

Clauses demanding frequent and efficient service, as well as safety for patrons of the line, will be inserted in the proposed franchise before conclusive steps are taken. The fare is not to be more than any zone fare in the city. In this way the city will receive adequate compensation for relieving the company of surface paving conditions. In exchange for the relief obtained through revision the Wheeling Traction Company will expend \$65,000 in rehabilitating the line.

Seeks Higher Rates in Norfolk But Not Richmond

Substantial increases in rates on its Norfolk, Va., division are asked by the Virginia Electric & Power Company in a petition just filed with the Virginia Corporation Commission. The case will be heard on Dec. 16. The company asks a cash fare of 10 cents, with three tokens for 25 cents and weekly passes at \$1.50, the passes to entitle bearer to ride the company's cars or buses at will during the seven-day period. School tickets will be 24 for \$1, if the petition is granted. Under the new schedule free transfers will be granted between street cars and buses on the division and all zones will be abolished. The company asks that the new rates and provisions become effective Jan. 1.

The City Council of Norfolk has petitioned the State Corporation Commission to grant the company the new schedule. The latter has agreed to reroute its lines in accordance with recommendations of a recent commission which investigated the traffic situation in Norfolk for the city government. It is claimed by the company that it is making at present only 2 per cent on its properties in the Norfolk division.

In connection with the desired increase in fares in Norfolk, Mr. Wood said that the company felt honor bound, not to ask for an increase in Richmond for at least a year. In that city the company was not now making the 8 per cent on its investment to which it was entitled under the law. The company hoped, however, that the new bus routes and the railway extensions under the new franchise would make up the revenue.

He pointed out that Norfolk now has three fare zones, operative particularly on the line through the city to Ocean View and Willoughby Spit, and that the new fare would do away with zones entirely. He also said that the new fare was based on extensive rerouting and other plans recommended by a traffic commission. Only about 5 per cent of the users of the Norfolk system would pay the 10-cent fare under the new rates, Mr. Wood said statistics would show. The other 95 per cent would either ride on the tokens, which will be procurable for 8½ cents, or use a weekly pass, which was to be transferable and would cost \$1.50.

Improvements to Be Made by Inland Empire

Ralph Budd, president of the Great Northern Railway, says that if the purchase of the Spokane & Eastern Railway & Power Company and the Inland Empire Railroad by his company is approved by the Interstate Commerce Commission extensive improvements will be made during 1927 on the lines purchased. The properties to be taken over operate from Spokane to Coeur d'Alene, Idaho, and from Spokane through the Palouse wheat district to Moscow, Idaho. The Inland Terminal building and grounds will be leased or sold when physical connections are made between the two systems, permitting the Great Northern depot to be used by the electric lines.

New York May Do Something About It

Public Interest Has Recently Become Aroused Over the Direction in Which New York City Is Headed in a \$1,000,000,000 Expenditure for Rapid Transit Lines Intended to Be Municipally Operated, but Which Must, After an Experimental Period of Three Years, Be Run at a Fare that Will Cover Costs—Unification with Existing Lines Suggested—Some Angles of the Situation Reviewed

SOBER attention is being focused on the transit situation in New York. Not since the negotiations of the so-called dual subway contracts of 1913 has the transit matter been so much in the public prints as has been the case in the last few weeks. Many circumstances have worked to this end. The agitation about the pending bus contracts has been consistent. The matter has become a public issue by the attitude of Comptroller Berry. The transit companies, notably the Brooklyn-Manhattan Company, have issued several statements, among them an opinion by Charles E. Hughes that it would do the city no good to attempt to write into the pending bus contracts stipulations seeking to fix the fares. Coupled with all this has been agitation about a revival of the plan for the unification of all the local systems. This last would involve the ditching of the dual contracts, so called, under which the subways are now operated, and the making of new contracts in which the 5-cent fare, according to Chairman Delaney of the New York City Board of Transportation, would not be a primary consideration.

It is impossible to go into all the political angles of the matter. It should be said, however, that a large part of the credit for having raised the subject of transit as an issue is due to Comptroller Berry. He insists that the matter of subway financing overshadows all other questions of city finance and says there can be really no determination of other pending problems until the subway question has been settled. Mr. Berry is not committed to any particular plan, but he has declared emphatically that he cannot see how the city can go ahead with any of its other projects until this question has been disposed of. He favors the immediate appointment of a board of expert engineers to examine the proposed plans before further expenditures are made on the system now under construction.

MUNICIPAL SYSTEM UNDER CONSTRUCTION

Right here it should be explained that the city of New York is committed at the present time to the construction of a system of rapid transit lines, intended to be run by the municipality itself, estimated to cost \$625,000,000. Mr. Berry and others, many of them experts in matters of this kind, say the cost of this system may run as high as \$1,000,000,000. In order to complete the system by 1931 the estimated money requirements from 1925 and 1926 were set down at \$238,000,000. To date only \$94,605,157 has been appro-

riated. Critics of the program of transit construction to which the city is committed say that even this inadequate amount of more than \$90,000,000 has been secured only by neglecting other important municipal improvements. By legislative act the proposed city system will be compelled to operate at a 5-cent fare for the first three years. After that service will be at cost. As a consequence the losses for this period, according to estimates made by the Board of Transportation,

Some of the Reasons for the Commotion

NEW YORK CITY is engaged on a program for the construction of subways intended to be operated by the city estimated by its proponents to cost \$625,000,000. Other estimates of the probable cost place the sum at more than \$1,000,000,000.

Real alarm is now being sounded by business bodies at the probable effect of all this on the credit of the city. These are some of the reasons for that alarm: So far contracts to the extent of about \$100,000,000 have been awarded. In order to complete the system by 1931 estimated money requirements for 1925 and 1926 were set down at \$238,000,000.

Mayor Walker has said that he "knew this traction thing would turn out all right." Comptroller Berry isn't so sure about it. As for Chairman Delaney of the Board of Transportation, he has recently had something significant to say on the matter of unification to include the existing carriers. Still more recently Chairman Dahl of the B.-M.T. has made public letters discussing the prospects.

will be \$61,994,800. According to Mr. Berry, the city's present annual deficit on its non-earning investment in the existing rapid transit facilities is \$13,845,000. As critics of the present program see it, the competitive operation of the city system will not accelerate the date when the city will receive a return on its investment in the existing rapid transit system, publicly owned but privately operated.

Alarm expressed by Mr. Berry at the situation as it now stands is shared by the Real Estate Board of New York City, which feels that the present subway program threatens the financial stability of the entire city. Lawrence B. Elliman, chairman of this board, stated recently that the billion-dollar program developed during the Hylan régime, and generally indorsed by Mayor Walker, will bring the city's debt up nearly 50

per cent, to the unheard of value of 25 per cent of the assessed value of New York City's taxable property. According to Mr. Elliman, confusion and bankruptcy seem inevitable for the city.

A MATTER FOR TECHNICAL RATHER THAN POLITICAL ATTENTION

The natural reaction to that thought is that the greatest care must be exercised to develop systems with economy and foresight and to operate them so that they will be the least possible burden on the public. According to Mr. Elliman the New York public has been unmoved by the traction situation that has been skidding along on the brink of despair for so many years. As he sees it, the solution of the matter is largely in the hands of men elected to public office untrained in the technic of transportation and that the matter too frequently receives such casual treatment as was meted out to it by Mayor Walker when he said, confidently, that he "knew this traction thing would turn out all right."

According to Mr. Elliman the baffling problem is not engineering or even financing but discovering some way to engage the public attention long enough to obtain public understanding of the situation. The financial condition of railways had but little effect on the public, but he thought it would be interesting to see if the possible fear of bankruptcy of the city of New York itself would prove to be sufficiently vital to the people themselves to cause New Yorkers to pause for a moment in their mad rush to contemplate the direction in which the \$1,000,000,000 municipal subway scheme was heading them. If their attention could be arrested, then perhaps the public would demand that technical rather than political attention be given to this most threatening problem.

But the rapid transit matter, as such, is not the only problem. Tied in with it is the subject of granting bus franchises. Here again concern is expressed for the future outlook. The committee on city transit of the Merchants' Association has expressed its appreciation of the estimates and facts contained in the report by the Board of Transportation relating to the various routes proposed, but the committee has indicated that it is unable to agree on the policy recommended by the board in that it (1) disregards the principle of unification and economic utilization of existing means of transportation and (2) fails to consider the property rights of companies now operating. It says that it is in the interest of all the people of New York City that this ques-

tion shall be settled along sound economic lines. It wants the public clearly informed that any attempt to develop a city-wide system of independent bus operation is a distinct movement away from the principle of unification. The committee agrees with the principle of the proposals before the Board of Estimate and Apportionment, the law-making body of the city, which provides for a zone system of fares on the proposed bus lines with a 5-cent charge for shorter hauls and higher charges for long hauls, but it says that it clearly recognizes that for longer distances in less congested sections it is impossible for buses to operate profitably at a straight 5-cent fare.

WHY THE DISCRIMINATION?

It contrasts this situation with the one under which present surface railways are forced to operate at a 5-cent fare, irrespective of distance, even though the actual cost of transportation on these lines is in most cases considerably in excess of 5 cents. It says that any further attempt to introduce competing bus routes would still further deplete the earnings of the surface lines and render more complicated the present transit situation. Its idea is that the existing transportation carriers should be encouraged to develop bus lines within their territories as auxiliaries and feeders, whenever circumstances render such action desirable or practicable. It says that any other method of handling the question of surface transportation will merely lead to increased costs and further complications which would inevitably postpone a solution of the transit problem in New York.

In a communication to the Mayor, the Merchants' Association contends that the plan of the Board of Transportation for a large number of segregated bus systems is economically unsound and adverse to the public interests. The association says that the plan should be abandoned and in place of the proposed fifteen unrelated systems in competition both with trolley and subway systems, there should be substituted four large systems based upon the principal existing facilities and fully correlated with such new bus lines as are required to meet the public needs fully.

A BIT OF BUS BACKGROUND

In contemplating this situation in its various aspects the tendency of the narrator unmistakably is to go too fast. It should, perhaps, be explained at this point that the proposal to issue franchises for additional bus routes in the city has been in the offing for many months past. Mayor Hylan, when he was in office, kept promising to do something about the matter, and Mayor Walker, who succeeded Mayor Hylan on Jan. 1 last, took up the talking where his predecessor had left off. Report has followed report on this matter, but there has as yet been no action. As late as Sept. 15 the Board of Transportation submitted a 1,088-page finding to a special meeting of the Board of Estimate on the proposal to award bus franchises to private corporations. The substance of the recommendations of the board was that the franchise be

awarded only to a corporation of great financial ability and for city-wide operation only; that there be strict adherence to the 5-cent fare principle with a possible charge of 2 cents for transfers. On the basis of the present bids, the Board of Transportation indicated that the offer of the Equitable Coach Company was the most favorable in that it was the only one that came anywhere near meeting the rigid conditions set down. The way was left open, however, for further negotiations with other concerns eager to enter the bus transportation field. This report was referred to the committee of the whole of the Board of Estimate, without comment and there it has rested since, without action.

There has been a veritable avalanche of bus bids. In one form or another

Lessons in Subway Finance

GERHARD M. DAHL, chairman of the Brooklyn-Manhattan Transit Corporation, is engaged in writing a series of letters to New York City's Transit Commission and Board of Estimate which should, when the final one is drafted, be gathered together in a textbook for use by rising politicians. It is probably too late to teach the older generation of Tammany that no way exists for making a nickel buy as much transportation as it did a dozen years ago. They will live and die without discovering the truth, not because they are unable to grasp it but for the reason that they do not want to. But light will gradually break into the younger Tammany mind, and Mr. Dahl's letters are helping. — *Wall Street News.*

the proposals now exceed 100 in number. The local railways have expressed their willingness to run buses, and all the principal ones have made bids for the right to operate. Among these applicants is the C. I. & G. Bus Corporation, subsidiary of the Brooklyn-Manhattan Transit Corporation, and of the Brooklyn City Railroad. The proposal made in behalf of this company contemplates operation on a service-at-cost basis. In the hope that it will be useful in the final solution of the relief that can be afforded to transit and traffic conditions by auxiliary bus service, Gerhard M. Dahl, chairman of the Brooklyn-Manhattan Transit Corporation, has sent to the Board of Estimate and Apportionment a communication dealing with the fare conditions contemplated for inclusion in the bus franchises. Mr. Dahl's concern is with the reiteration of the statement made publicly about a 5-cent fare. The proposed form of franchise suggested by the Board of Transportation recommends that such fixed fare on each route or zone shall be 5 cents.

Similar statements by public officials have caused general public belief that the bus fare will thereafter be 5 cents. The question that arose in the minds of some was whether the city had the power to compel a fixed fare and to require the grantee of bus franchises

to abide thereby, beyond state power to fix a reasonable fare higher or lower than such fixed fare. It was Mr. Dahl's thought that if the city does not have such power, the situation should be so thoroughly understood that the public will not be misled by repeated statements that all applications must be on a 5-cent basis, with consideration given only to other favorable conditions of proposed offers and with the final claim that the bus situation has been successfully "solved" on a "5-cent fare" basis. The position of the company which Mr. Dahl represents is that cost-of-service is the legal and sound basis upon which the city should consider the granting of bus franchises. It further believed that any effort to impose an arbitrary fixed fare was lacking in candor to the public in the light of the legal situation controlling the granting of franchises.

Here, indeed, was a mighty serious situation. If the city did not have the actual power to fix fares, the public would, by such claim, be further deluded for a time on the economic principles controlling permanent transportation service. Furthermore, any applicant with a knowledge of the possible limited power of the city to fix fares could afford to go far in its offer of routes, service and other matters. Thereafter, if it were granted franchises on such an apparently liberal offer, it could secure, by proper proceedings, the fixing of fares at the then cost of service. In order that the questions about fare fixation should be made as clear as possible, Mr. Dahl's company asked Charles E. Hughes to consider the matter and to express his opinion thereon. It will be recalled that the Public Service Commission law was passed when Mr. Hughes was Governor of the State of New York. Mr. Dahl on Dec. 1 transmitted to the Board of Estimate a copy of Mr. Hughes' opinion for its consideration. The question submitted to Mr. Hughes was:

"Would a bus franchise granted under the form of contract proposed in the second report of the Board of Transportation enable the city to terminate the franchise in case an increased rate of fare were charged under the authority of the Transit Commission?"

The opinion by Mr. Hughes is one of some fifteen pages.

THE SENEGAMBIAN IN THE WOODPILE

Stated in other words, the question was whether the city, in granting a bus franchise, has authority to contract with the grantees that the latter shall not avail themselves of the exercise of the rate-making power vested in the Transit Commission. Mr. Hughes concludes that any attempt to create a contractual obligation on the part of the carrier to charge a fare which the Transit Commission finds to be unjust and unreasonable, or not to charge a fare which that commission finds to be just and reasonable, in the exercise of its jurisdiction under Sec. 49 of the public service commission law, would be abortive and that a stipulation to that end in the grant of the franchise would be null and void. Mr. Hughes says that the provisions of the public service commission law must be taken as read into the franchise, and the provisions of

that law contemplate the exercise of authority over fares or other rates on the part of the commission. And the Transit Commission, as the successor to the Public Service Commission for the first district of New York, is a creature of the state. There apparently is the Senegambian in the woodpile.

The first reaction in official city circles to this expression of opinion by Mr. Hughes was that further delay might result in the granting of the bus franchises. Mayor Walker was inclined to believe, despite the opinion of Mr. Hughes, that the provision in the proposed franchises which fixed the fares at 5 cents and binds the franchise holder not to appeal to the Transit Commission or to the courts for a higher fare, on the penalty of the forfeiture of the franchise, was legally binding. His idea was that if this were not the case, the law should be amended to give the city the power to make supervision of this kind binding.

Mr. Delaney, the chairman of the Board of Transportation, raised the point that if Judge Hughes were correct in the views that he held, the alternative would seem to be municipal operation. The city, however, would need legislation to empower it to operate a bus system and Mr. Delaney said that any franchise granted in the meantime should be for the shortest period possible and that any attempt by a franchise holder to increase the fare in accordance with Mr. Hughes' opinion should be tested in the courts.

DISCUSSION OF UNIFICATION STARTED

While all this was going on, informal discussions were held by the Board of Transportation with railway representatives on the matter of the possible unification somewhat in keeping with the suggestions contained in the plan advanced by the Public Service Commission about five years ago. This plan, it is understood, contemplates the formation of a new semi-public corporation, the only outstanding securities of which would be a small issue of stock so allocated between the two groups as to divide control evenly between the public and private interests. This corporation would take over from the public and from the city operating rights, but not the ownership of any property. It would assume the active management of all lines involved in the consolidation and run them as a unit in the interests of the traveling public. All of the subways and all of the elevated lines of the city, both those now in existence and the city lines under construction, and such other transit lines as would be vital to the city, would be under its control.

Thus the matter quickly became one for public discussion. All of the newspapers took it up according to their lights and leanings; the Transit Commission issued a statement of its position in the matter; Mr. Dahl of the Brooklyn company made the position of his company plain in several statements addressed to the Board of Estimate and Apportionment and the Transit Commission, and Frank Hedley, president and general manager of the Interborough Rapid Transit Company, also stated the position of his company.

The statement made by Mr. Delaney looking toward possible unification was presaged upon events at the conferences held with transit officials some time ago. These conferences were to have been resumed about July 1. The strike on the lines of the Interborough and other important matters delayed things, and the Mayor has not yet called the conference to reconvene. This conference, when it is reconvened, members of the Transit Commission expect to attend. The commission made it plain that in accordance with its desire to co-operate as much as pos-

The Stage Is Set for Action

EVEN the public authorities have been at outs with each other. Up to the first of last May the city administration would have no trucking with the State Transit Commission. First of all, the commissioners were Republican appointees. Then, too, Mayor Hylan conceived a bitter animosity for the chairman, George McAneny. The most friendly personal feeling existed between the Transit Commission (state) and Mr. Delaney's Board of Transportation (city), but only the most informal sort of co-operation was possible between them in such a rough set of partisan politics and personal feeling. Up to the first of January any constructive solution of the transit problem as a whole was obviously caught in an immense jam. But now the scenes have been completely shifted; the stage is set for action. In the first place Mayor Hylan is eliminated. With his going the emotional tension has almost disappeared. Officials of the railways no longer expect to have bad names hurled at them at long range from the City Hall.—*New York Times*.

sible with the city authorities, its policy has been in all cases to lend its friendly offices in the hope that an agreement can be reached between the city and the transportation interests, the expectation being that progress can be made in this way much faster than by formal proceedings.

RAILWAY MAN STATES FACTS IN SIMPLE TERMS

Mr. Dahl's communications have shed light on a situation complicated by many moves and made unintelligible to many people by the magnitude of the whole question, the stupendousness of the amounts of money involved, and the seeming conflict in authority between the Board of Estimate and Apportionment and the Board of Transportation, which are purely New York city bodies, on the one hand, and the Transit Commission, a state body which is really a court of last resort on fare and other matters, on the other. Mr. Dahl said in the first of his communications that the economics of the transit relief were comparatively simple, but that the politics of it were not so easy. He expressed confidence in the sound common sense of the people of the commu-

nity and expressed the belief that if hostility were eliminated and the problem approached in the spirit of mutual consideration, fairness and patience, a solution could be provided which would meet with the approval of the public. He said that as differences of opinion might exist or arise in connection with the discussion of any complicated problem, any seeming criticisms were advanced in a friendly spirit for the purpose of arriving at the truth.

As has been indicated before in this review, the proposed new independent system of subways, conceived during the Hylan hierarchy, was not planned with a view to its consolidation with the existing systems. According to Mr. Dahl, expert opinion bore him out in the statement that competition and consolidation are the opposite ends of the poles in subway policy. He did not subscribe to the idea that the completion of the proposed new municipal system was necessary because it would give the city a club to hold over the heads of the Interborough Rapid Transit Company or the B.-M. T. The question he asked was this: "Why assume that a club is needed until there is evidence that someone desires to act unfairly?" He said there had never been a time when the B.-M. T. was not ready and willing to enter into open conference with any public authority for the purpose of helping to solve New York's transit problem.

One of the things Mr. Dahl did was to go into figures to show that at the end of 1933, after three years of operation of the new system by the city, the city's deficit on the existing systems, at the present annual rate, will have reached the sum of \$110,760,000 for the years 1926 to 1933 inclusive. This added to the \$61,994,600 losses on the new city system will make the total deficit of \$172,755,800, which the taxpayers in New York will be called upon to meet. At the end of the three-year period, the law requires that the city system must be self-sustaining, and the Board of Transportation's own figures from 8 to 10 cents.

Another question Mr. Dahl asked was this: "Isn't this rather an expensive club?" As a matter of fact, he wanted to know whether it really was a club at all. He said it should be borne in mind that if the existing contracts between the city and the companies continue, the city system will then be operating at a rate of fare ranging from 8 to 10 cents, while the Interborough and B.-M. T. are operating at a 5-cent fare. Another question he asked was: "Which line will then be patronized?" This was largely the burden of the remarks contained in Mr. Dahl's first statement. In subsequent communications addressed by him to the Board of Estimate he elucidated the figures, but that is neither here nor there so far as the purpose of this account is concerned.

In short, were the city to apply sound business principles to its rapid transit program, construct needed additional facilities and co-ordinate the operation of its facilities, its entire rapid transit investment could be put on a self-sustaining basis at once. According to Mr. Dahl, such procedure would

release frozen city credits of \$262,626.-296 and make available additional city sums for subway construction, or private capital might be induced to provide for subway construction. He said that such a policy and program would mean rapid transit construction on a business basis in pace with the growth and business expansion of the city, not the feast and famine of the past.

WALL STREET REVELS IN RUMORS

Another question that is being asked is: "Will there be a consolidation of the transit companies, notably the Interborough and the B.-M. T., whether or not the unification scheme is adopted?" Financial circles believe there will. It is a vague unconfirmed rumor that is going the rounds about quiet acquisition on the part of the B.-M. T. interests of the stock of the Interborough Rapid Transit Company. Wall Street bases its conviction that there is something in the rumor on the fact that I.R.T. stock, which has not paid a dividend since 1919 and is apparently not likely to pay dividends in the near future, has risen from a low of about 24 to more than 52, the highest point reached since the voting trust now in control of the company was formed. This gossip is repeated for whatever it may be worth. The fact remains, however, that the voting trust certificates of the I.R.T., to which dealings are now confined, does not give the new holders an immediate voice in the management. The voting trust does, however, expire next October, and again Wall Street gossip, which is ever ready to find a way, says that the recent buyers will then have their say and that in the meantime they can make their ideas felt in any emergency that may arise.

This account does not, of course, run the gamut of all the recent moves, but the facts set down do show, as stated in the introductory paragraph, that the realization is being borne in upon the substantial interests in the community of the need for something constructive being done and done promptly to save the city from itself.

Shreveport Temporary Injunction Made Permanent

Three federal Judges have made permanent without any objection being offered by the Public Service Commission the injunction issued in June of this year restraining the Public Service Commission from interference with the Shreveport Railways, Shreveport, La., in the collection of a 7-cent adult fare and a 3½-cent school children fare, which was granted. In its application to the federal Judges for a permanent injunction, the company showed that under the above-mentioned rates it had not made a fair return on the value of its property, but the results of operation had changed from a constant loss to a small net profit.

Early in June of the present year the United States District Court, Eastern District of Louisiana, handed down a decision declaring null and void the order of the commission rendered on March 16, 1925, ordering the Shreveport Railway to offer seventeen tickets

for \$1 and four tickets for 25 cents. In the order the company was authorized to discontinue the sale of four tickets for 25 cents and seventeen for \$1 and to charge 3½ cents a ride for school children during school terms and school hours. The court also restrained the commission from attempting to enforce the said order of March 16, 1925, or from interfering in any way with the plaintiff in charging and collecting the 7-cent fare. That decision in June ended the litigation which had been carried on for some three years between the Shreveport Railways and the court. The entire situation was reviewed in the *ELECTRIC RAILWAY JOURNAL*, issue of June 12, 1926, page 1025.

Chamber of Commerce Rejects Toledo Ordinance

The proposed new 25-year exclusive street railway and bus franchise for the Community Traction Company in Toledo, Ohio, already opposed by the Street Railway Board of Control, has been rejected by the Chamber of Commerce, representing the business interests of the city. The attitude of this organization was determined by an exhaustive study of the new ordinance by a committee over a period of nine weeks.

Many individual faults are found in the ordinance but the committee objects to it as a whole principally because of the granting of an exclusive franchise for 25 years with renewals which make it perpetual, and the provision that it can only be terminated by city purchase so as to guarantee the retirement of the outstanding securities of the Community Traction Company. The committee in its report favored a monopoly of the service provided the city had a method of withdrawing the exclusive feature by a reasonable procedure.

The independent group of business men who made the study of the transit problems did so in the light of existing conditions and recommended that capital value be maintained as at present, that the new capital of \$1,051,600 for improvements be added, and that extensions be made, crosstown line developed, and new bus routes established as recommended by Prof. Riggs. These important recommendations with many minor suggestions were contained in the report made public by the Chamber of Commerce committee and unanimously approved by the trustees of the organization. The principal ones are:

1. To grant an exclusive franchise so that it may be terminated at the end of ten years to permit competition by two-thirds vote of City Council, street railway board of control, and 60 per cent of the electors.
2. To stop the payment of interest on bonds retired and canceled under sinking fund provisions.
3. To give Board of Street Railway Control power to approve contracts before instead of after execution.
4. To relieve traction company of paving obligations and in exchange ask the ownership to absorb the accumulated deficit of \$850,000. Paving obligations run \$100,000 or more annually.

5. To charge a maximum fare of 10 cents.

6. To give the traction company freedom to buy its power at best price, not limiting it exclusively to Toledo Edison company as source for power.

For some time now efforts have been under way between Frank M. Dotson, law director of the city, and Dewey C. Bailey, counsel for Henry L. Doherty & Company, to come to an agreement on some of the suggestions made by the Board of Street Railway Control in a letter which has not been made public but which was in answer to the request of Mayor Fred J. Mery for specific recommendations after the criticism of the board. It is understood the board of control referred the city authorities and ordinance conferees to a letter sent July 29 in which specific recommendations were made but apparently not followed in drafting of the ordinance.

The proposed ordinance which seeks to modify the Milner service-at-cost plan in conformance with proposals of Prof. Henry E. Riggs is now before the City Council. Indications are that it will have to be modified before it can be placed before the electors.

Final Fare Brief in St. Louis

An increase of fare by the United Railways, St. Louis, Mo., from 7 cents to 8 cents or two tokens for 15 cents would mean more passengers for the People's Motorbus Company. So Joseph H. Grand, city attorney for University City, St. Louis County, contended in a brief filed with the Missouri Public Service Commission on Nov. 30. In opposing the increase he held that no emergency exists which demands an advance in fares. If any increase is to come, he said, it can well await the completion of the audit of the railway's books.

In answering the argument by City Counselor Muench of St. Louis that the city should not be asked to make up the company's losses on its St. Louis county business, Mr. Grand contended that the United Railways is a single system and cannot be separated for the purpose of fare. He concluded his argument with the assertion that an increase would do the United Railways more harm than good.

St. Louis financial circles anticipate an increase in the fares. A decision to this effect by the commission would go a long way toward removing one of the few remaining obstacles to the reorganization of the system and the vacation of the receivership. It is believed that the decision when it is made will stipulate the rate of return to be allowed the new company on a fixed valuation of its property.

The belief is firm that the commission will reiterate its stand in the Laclede Gas Light Company case, decided on Nov. 20, when it said that a fair rate of return on public utilities was 7 to 8 per cent. That decision was also strictly in line with the finding of the United States Supreme Court, which held on Nov. 23 in the Indianapolis Water Company case that a utility is entitled to a return of at least 7 per cent.

Additional Names Have Been Secured

Following the striking off of some 4,000 or 5,000 names from the referendum petition, filed in Kansas City, Mo., recently by a group of Republicans, asking a referendum on the twelve-year franchise extension granted the Kansas City Public Service Company, additional names have been secured and the supplementary petition filed with the city clerk. Alleging that many of the 13,238 names on the original petition were written by the same persons, officials struck off a large percentage of the names, making it necessary for the sponsors of the petition to secure approximately 4,000 additional signatures. Ten days were allowed the originators of the referendum petition in which to secure names to replace those cut out by the city clerk's office. The new list, filed Dec. 3, contained 7,886 names, more than sufficient to make up the deficit. The city clerk is allowed five days in which to make a canvass of the petition for errors.

Denver Changes Methods of Letting Utility Franchises

The City Council of Denver, Col., at its Nov. 29 meeting decided upon a change in the method prescribed by it for letting utility franchises. The regulation had previously required the petitioner to submit his proposition at least six months before the date the voters were expected to pass on it and to publish the terms and rates twice in newspapers of regular and large circulation. That portion of the law was killed. The Council stated it was superfluous and inactive and that the city charter and state laws were adequate to take care of such contingencies.

Changes in Honolulu to Prevent Fare Increase

Curtailment of service and extensive rerouting are included in the plans of the Honolulu Rapid Transit Company, Honolulu, Hawaii, designed to avoid for the time being an increase in the rate of fare and to approach more closely the fair return on the existing investment as computed by the Public Utilities Commission. An announcement to this effect was made recently by President Alfred L. Castle.

A petition requesting permission to reroute the company's cars over practically every line in the city and to eliminate certain phases of the service now furnished has been filed with the Utilities Commission. Statistics made public indicate that the company has suffered not only material decreases in passenger traffic, due largely, it is said, to the rapid increase in the number of automobile owners, but also decreases in its new revenues in spite of the recent increase in the fare. In addition to the rerouting and discontinuance, the company plans to purchase eight one-man, two-man cars at the cost of about \$136,000 and a bus to operate in Kaimuki.

In his explanatory statement Mr. Castle said that the directors had

studied the proposition from every angle and were making every effort to effect savings which would not mean an increase in fare. He said that in the internal organization the personnel had been materially cut down to a point beyond which it was not advisable to go.

In its decision of September, 1924, the commission found that the company had properties devoted to public service to a fair value of \$3,250,000, on which it was entitled to a return of \$260,000. New rates went into effect on Oct. 1, 1924. In 1925, with a full year of these rates, the company's net revenue was \$198,654, which was about \$60,000 less than the amount to which it was entitled by the decision of the commission. Mr. Castle said that this year, in spite of all the economies practiced, the net earnings would probably run about \$150,000. This is \$110,000 less than the fair return allowed by the commission. Another basis of comparison was the first ten months of 1925 compared with 1926. In 1925 the net revenue for the first ten months was \$162,584, compared with \$133,054 for 1926. This was due, he said, to the falling off in the number of passengers carried. The figures of the first ten months of 1925 show 13,452,782 full-fare passengers and 1,147,502 half-fare passengers; for the first ten months of 1926 these figures were 12,710,246, and 1,123,652, respectively.

He claimed that the extensive rerouting could be done at very little expense and that the saving by the rerouting and by the installation of one-man operation on certain lines would total \$50,000 a year.

In filing its petition the company has requested a public hearing on all proposals involved.

News Notes

Wages Discussed at Indianapolis.—Members of a committee recently selected by employees of the Indianapolis Street Railway, Indianapolis, Ind., to discuss a request for an increase in wages and a change in working conditions with company officials, met recently with James P. Tretton, superintendent, in a preliminary conference. No wage demand was presented by the committee and it was said that the wage changes would be advanced later at a meeting with other members of the company's official body.

Bulletins Link Old and New.—In order that the present generation of trainmen in New Brighton, Pa., may keep in touch with their Victorian ancestors the Beaver Valley Traction Company issues bulletins from time to time on the 25-year men who are now pensioned employees. Addressed "Dear Fellow Employee" and signed by General Manager Smith, these pamphlets disclose the whereabouts of an old employee, his date of entrance into service and the conduct of his service.

Collectors Expedite Traffic.—Eleven collectors have just been placed on duty

at down-town street corners in Atlanta by the Georgia Railway & Power Company to aid in speeding up traffic during the rush hours. These collectors will be on duty every afternoon except Sunday from 4 o'clock until 6:30 and will accept fares, make change and collect tickets.

Tickets to Increase Earnings.—The Danville Traction & Power Company, Danville, Va., has announced that on Jan. 1 it will put on sale tickets for \$1 permitting an indefinite number of rides. These tickets will be transferable. The new rate will be tried for an experimental period of eight weeks to determine the effect of the change upon earnings.

Must Arbitrate in Danbury.—A deadlock exists between the striking employees of the Danbury Power & Transportation Company, Danbury, Conn., and the railway management, with the company unwilling to recognize the Amalgamated Association under a similar working agreement to that in force with the Danbury & Bethel Street Railway. That was the old organization out of which the new company grew. The City Council has formally notified the company and the Public Utilities Commission that failure to arbitrate the dispute will mean the canceling of all existing franchises. The intention of the company to motorize the system brought about the present tense relationship.

Veterans Receive Buttons.—The Wheeling Traction Company, Wheeling, W. Va., now has 106 employees who have been in the service of the company for twenty years or more. Nine veteran workmen of the company were recently presented with service buttons, which automatically makes them members of the Veterans' Association. The service buttons were presented by A. C. Spurr, general manager of the Wheeling Traction Company. The Veterans' Association was founded four years ago. The oldest member is M. C. Marsh, who has been in the employ of the company for more than 38 years.

Hearing Held Over.—Rehearing before the Interstate Commerce Commission on the application of the Salt Lake & Utah Railroad, Salt Lake City, Utah, to participate equally with other roads in the hauling of transcontinental freight has been postponed from Dec. 3 to Dec. 11. The rehearing was deferred at the request of the railroad, as well as the opposing trunk lines.

Must Serve Sentence.—A petition to suspend the balance of his sentence of 120 days which he has been serving since Sept. 9 in the Marion County jail was recently denied Harry Boggs by Federal Judge Robert C. Baltzell. Boggs, former head of the union on the Indianapolis Street Railway, Indianapolis, Ind., was sentenced for contempt of court when he was charged with violation of terms of an injunction prohibiting interference with the operation of street cars during the strike last summer. Judge Baltzell maintained no substantial reasons had been presented to warrant a suspension of the sentence. Reference to the Boggs incident was made in the ELECTRIC RAILWAY JOURNAL, issue of Oct. 23, page 778.

Recent Bus Developments

St. Paul Admires Its Twin City

Inspired by the convenience and success of the new Hennepin Avenue 10-cent bus line in Minneapolis, Minn., from the heart of the city to 36th Street, operated by an auxiliary of the Minneapolis Street Railway, Commissioner C. J. McGlogan of the St. Paul City Council will present a resolution which will authorize taking up with the Minnesota Railroad and Warehouse Commission a request for similar service in that city. He is also taken with the Minneapolis system of crosstown bus lines on Lowry Avenue and on 38th Street, which connect with trolley lines at the same rate of fare and with transfer privileges. T. Julian McGill, vice-president of the Twin City Rapid Transit Company, said that the 10-cent bus line in Minneapolis was demanded and made possible by business men. The line is not in competition with the electric railway lines and pursues a devious course, crossing trolley lines at four points. Mr. McGill said that if St. Paul would provide a profitable route that did not compete with street cars the company would be glad to operate a 10-cent bus line over it.

Hearing on Bus Specifications in New Jersey

The Board of Public Utility Commissioners of New Jersey has under consideration the amendment of the specifications applying to buses adopted on Dec. 29, 1924, and is also planning to adopt specifications relating specifically to buses of what is commonly known as the de luxe type.

With the end in view of obtaining the views of auto bus operators, manufacturers and others interested a conference between the board's transportation department and all parties interested will be held at the offices of the board in Newark on Dec. 21, at 11 a.m.

In anticipation of the hearing the board has transmitted to bus operators and others through Philander Betts, its chief engineer, a copy of the specifications intended to apply to the street car type of vehicle.

Cleveland Councilman Provoked at Bus Losses

Councilman Herman H. Finkle, Republican floor leader of Cleveland, Ohio, has raised the question of the losses alleged to have been sustained by the Cleveland Railway in the operation of its buses. He has suggested the abandonment of the bus lines. Mr. Finkle said that bus operation in Cleveland had, since its inception on Aug. 1, 1925, piled up a loss of \$319,593. These are Mr. Finkle's figures. This total, it is said, does not include fixed charges of more than \$200,000.

The position of the Cleveland Railway is that the bus lines it sought to operate are paying or virtually paying

their own way. Such losses as are being incurred are piling up on the so-called feeder routes started at the behest of the Council. The position of Col. Joseph H. Alexander, president of the Cleveland Railway, is that the company, if the criterion sought now to be applied to the buses is to prevail, should abandon the operation of certain rail lines which have failed to pay profits for years.

Street Railway Commissioner Ballou is in accord with Colonel Alexander in this matter. He said that the Council ordered operation of the bus routes which are said to be losing money. It seems that under the provisions of the service-at-cost plan at Cleveland the Council holds the power to alter all schedules of the railway and that if the members of the Council see fit they have the power to direct the abandonment of operation of buses on any lines on which they may deem the suspension of service to be desirable.

Indeterminate Permits Suggested for Buses

The Public Utilities Commission of Massachusetts is seeking the passage of legislation to place buses in the same category as street railways with respect to licenses. At present licenses are issued to bus companies for only a short duration. The commission wants the period of the license indeterminate. The change is expected to improve service and stabilize investment in bus securities. The commission still favors licensing authority by cities and towns, but would appoint a state department to attend to the formulation of licenses.

Buses on Pennsylvania Line Increase Business

Since the Scranton Railway, Scranton, Pa., substituted a de luxe bus service for trolleys over the stretch from Carbondale to Forest City, Pa., there has been an increase of 130 per cent in the number of passengers carried. For the present three buses are operating. The Carbondale-Forest City line runs through Vandling, a distance of 7.2 miles. The right-of-way is through a very narrow valley which is practically owned by the Delaware & Hudson Coal Company, with which an agreement regarding operating rights was arranged in 1902.

The track has always been a difficult one to maintain for spring freshets frequently damage the roadbed. In recent months the difficulties became even more serious. It would cost \$76,000 to restore the track to first-class condition. This, coupled with the fact that no permanent right-of-way could be secured, made the continued operation of the line practically impossible and hastened an application to the Public Service Commission for temporary abandonment and substitution of buses.

Would Increase Bus Service

The Lincoln Traction Company, Lincoln, Neb., has applied to the State Railway Commission for authority to abandon service on four car lines and substitute buses, in addition to the ones where buses give either supplemental or substituted service. If the permission is granted the company will have a total of fourteen buses in service. One of the lines upon which service will be abandoned is that operating between the city and farm campuses of the University of Nebraska. Buses will give more direct connection over paved streets and the service will be extended to include the suburb of University Place, 1 mile beyond. Another bus will supplant railway service to the more distant suburb of Bethany, reached from the center of the city by a circuitous route.

Bus Terminal in Philadelphia Under Consideration

The Public Service Commission announced recently that it would meet in the State Capitol in Harrisburg on Dec. 14 to consider the possibility of establishing an underground bus terminal to relieve traffic congestion in Philadelphia, Pa. The commission will receive the recommendations of its engineers and experts who have just completed a survey of bus operating conditions in New York, Boston and other metropolitan areas. The Philadelphia Rapid Transit Company, three railroads entering Philadelphia and independent operators of bus lines have been invited to attend and submit suggestions.

Wheeling Company Plans Bus Extension

If applications now before the Ohio Public Utilities Commission are granted the Wheeling Traction Company will more than double bus line mileage. The company now operates 65 miles of bus lines and has applied to increase this to 135 miles. This service is supplemental to its electric railway lines.

The company seeks a bus franchise between Wheeling and Steubenville by way of Warwood, Wellsburg and Follansbee, and a franchise between Wheeling and Moundsville by way of Benwood, McMechen and Glendale. The company proposes to operate special de luxe buses equipped with individual seats. In case the franchises are granted the company plans to extend service over Moundsville. It would give Moundsville a complete city service by creation of a route to the eastern part of the municipality, which is now without transportation facilities. The company has also asked for a franchise between Bellaire and Wheeling.

Bus Competition Threatened in Louisville

A new bus line is proposed for Louisville, Ky., to operate in competition with the Louisville Railway at a cash fare equal to that of the railway and a ticket fare three-quarters of a cent lower than the railway fare. The plans for the competitive service became known on Dec. 6 when an article was

published in one of the local afternoon papers regarding the formation of the Peoples Transit Company. There is talk of starting the new service before the end of the year, possibly by Dec. 16.

James P. Barnes, president of the Louisville Railway and its subsidiary, the Kentucky Carriers, Inc., stated that his company knew nothing definite about the proposed line until the plan was announced in the local daily papers. He foresees higher street car fares with such a situation. The railway must have an income sufficient to cover the cost of operating its cars. If its income is curtailed by competition, higher fares are inevitable.

As another commentator saw it, the operators of the proposed bus line would have to be smarter than are the railway men if they can make a bus line pay, as the railway has had plenty of experience in the field and has been unable to make expenses.

Mayor A. A. Will stated that the proposal had been known by city officials for some time, but that there were no existing laws which could keep the competition off the city streets, the only requirement being that the operators pay their taxes and licenses, and protect passengers and the general public by adequate insurance.

Third Bus Auxiliary Service Started.

—A new auxiliary bus service to the rapidly growing Center Hill suburb of Atlanta to supplement the service on the River Street car line has just been started by the Georgia Railway & Power Company. The bus operates on weekdays and a regular schedule, except during the noon hours, is maintained, connecting with the street car service on the River Line. The fare on this bus is 10 cents and entitles the passenger to continue his journey on the street car and transfer to any other line in the city. A transfer and 3 cents entitles the outgoing passenger to a trip on the bus line. The fare for passengers desiring to use only the bus service is 3 cents. This is the third auxiliary bus line put in service by the Georgia Railway & Power Company, the two others operating to Sylvan Hills and to Atlanta Avenue in the Grant Park section of the city.

Rerouting Serves New District.—The St. Louis Bus Company, auxiliary of the United Railways, St. Louis, Mo., has rerouted its Morganford-Loughborough Avenue line to serve a larger territory in Southwest St. Louis, and on Nov. 30 the Board of Public Service will hold a public hearing on the application of the company for a permanent permit to use the additional streets. Through this new connection the bus line gives the residents of one of the newer residential sections of the city a city-wide co-ordinated transportation service.

New Service Started.—The Canton, Akron & Cleveland Coach Company, a subsidiary of the Northern Ohio Power & Light Company, has started the operation of a new coach line between Canton and Cleveland, Ohio. Buses leave Canton every hour and consume about the same running time as interurbans.

Financial and Corporate

\$18,000 Surplus in Phoenix

Surplus of approximately \$18,000 is the result of the operation of the Phoenix Street Railway, Phoenix, Ariz., under municipal operations for one year ended Nov. 1. This fact was disclosed in a report submitted to the City Commission recently by City Manager Henry Rieger. In his report he recommends the rehabilitation of the line.

The report shows total receipts during the year at \$160,896 and total disbursements, including expenses and other costs, \$143,056. If the lines had been rehabilitated and up-to-date rolling stock secured it would have been possible to cut maintenance charges to \$26,666. Added to the cash on hand, it would have made \$44,506 cash on hand, and with a 7-cent fare the surplus for the year would have reached \$75,000 under proper operating conditions, according to General Manager Rieger. He recommends complete rehabilitation "as a decidedly good paying investment for the city and for the citizens of the city at large." He stresses the need for new, up-to-date, light one-man cars, which would net a saving of at least 25 per cent on power bills and possibly give a six-minute headway service.

Another factor in lowering the surplus for the past year has been the change in status of the employees. When all employees were placed on an eight-hour basis, it was done without any loss in salary to the employees. Where men were working eight, ten and twelve hours a day, the eight-hour rate was computed so as to give them an amount of salary equal to what they had been drawing under the longer day plan. The placing of the men on the eight-hour basis necessitated the employing of additional help, which raised the payroll about 20 per cent over previous years.

The city of Phoenix acquired the properties of the street railway by purchase on June 4, 1925, for \$20,000 and assumed direct operation and control on Nov. 1, 1925. Various circumstances leading up to the city's taking over the lines were reviewed in the *ELECTRIC RAILWAY JOURNAL* from time to time.

Plans Being Made to Refinance Michigan Interurban

The Grand Rapids Trust Company, receiver for the Grand Rapids, Grand Haven & Muskegon Railway, Grand Rapids, Mich., has notified the Michigan Public Utilities Commission that plans are well under way by the trust company and a committee representing the bondholders to refinance the road and lift the receivership.

Sidney L. Vaughn, general manager of the road, and Peter Kline of the trust company appeared before the commission on Nov. 30 and sought a permit to operate bus service between Grand Rapids and Grand Haven and between Grand Haven and Muskegon.

The application was opposed by the Safety Motor Coach Company, now operating between Grand Rapids and Muskegon and Grand Haven and Muskegon. The coach company asked for a permit to operate between Grand Rapids and Grand Haven in opposition to the request of the railway.

Mr. Vaughn told the commission the railway planned to supplement the present interurban service with buses, giving hourly service to the three cities from 5 a.m. one morning until 1 a.m. the following morning. He said that back in 1920 the passenger revenue of the line was \$486,780, compared with \$186,540 last year and \$122,965 for the first nine months of the present year. Both Mr. Vaughn and Mr. Kline denied that the Insull interests were back of the effort of the railway to get the bus permit.

The hearing was adjourned until Dec. 11.

Springfield Council Approves Agreement

The City Council of Springfield, Mass., on Dec. 6 approved the agreement between the city and the New York, New Haven & Hartford Railroad by which the railroad acquires the lines of the Springfield Street Railway. From \$1,000,000 to \$1,500,000 will be expended in improving equipment and service. This is another step in the plan for the restoration of certain electric railway lines in Massachusetts to New Haven ownership and for their physical rehabilitation.

Traffic Wage and Fare Figures

There was a slight decrease in the number of passengers carried during the month of October, 1926, compared with October, 1925. This can be traced partly to industrial conditions in certain sections of the country and partly to the fine weather which prevailed throughout the month, which tends to increase the use of private automobiles for transportation purposes.

The number of revenue passengers, including bus passengers, reported to the American Electric Railway Association by 207 companies for October, 1926, compared with October, 1925, is as follows:

October, 1926.....	807,623,596
October, 1925.....	809,134,380
Decrease, per cent.....	0.19

Average cash fares in cities of 25,000 population and over:

	Cents
Nov. 1, 1926.....	7.7423
Oct. 1, 1926.....	7.7056
Nov. 1, 1925.....	7.5996

Average maximum hourly rate paid motormen and conductors in two-man service by companies operating 100 miles or more of single track:

	Average Hourly Rate	Index Number 1913 = 100
		Per Cent
Nov. 1, 1926.....	56.88	208.73
Oct. 1, 1926.....	56.87	208.70
Nov. 1, 1925.....	56.29	206.57

\$10,000,000 Virginia Bond Issue Approved

Stockholders of the Virginia Electric & Power Company, Richmond, Va., have authorized a bond issue of \$10,000,000 to cover the expenditures contemplated in the 1927 program. Of the bond issue, \$6,000,000 in first and refunding mortgage gold 5s were offered publicly on Dec. 10 and the accruing fund will be made immediately available for next year's elaborate improvement program. It has also been voted to place the company's authorized capital stock at \$15,000,000 and to reclassify the \$4,513,000 of unissued 7 per cent cumulative preferred stock to be issued as 6 per cent cumulative preferred stock.

As a result of this and other steps now being taken Richmond's unified bus and railway system is expected to be in full operation before the end of next year, dependent largely upon the opening of new streets to the intended bus lines. According to William E. Wood, vice-president of the company, this improved system will cost the company about \$1,500,000. Several routes probably will be started in January on the receipt of buses now under construction. Tracks are also being extended and other similar work will be started as soon as practicable.

Approximately \$15,000,000 of the \$20,000,000 in the full 30-month program has been directed to new construction work and improvements on existing properties through Tidewater Virginia and eastern North Carolina.

Will Cease Cashing Warrants in Seattle

The Clearing House Association at Seattle, Wash., has unanimously refused to cash any more warrants for the Seattle Municipal Street Railway, declaring they are an illegal investment. The railway was slated to go on a warrant basis on Dec. 10 to pay labor and material costs for the last half of November. Mayor Bertha K. Landes advocates payment of warrants by city on date due, which will postpone warrant basis for two weeks.

Indiana Road to Start Afresh

The property of the Fort Wayne, VanWert & Lima Traction Company, Fort Wayne, Ind., has been sold at receiver's sale at Fort Wayne, Ind., to the bondholders for \$150,000. The bondholders were represented at the sale by Edward Hopkinson.

The company will be reorganized in accordance with terms outlined at some length in the *ELECTRIC RAILWAY JOURNAL* for June 12, page 1030, under which it is proposed to create a voting trust to continue for five years.

Spokane Interurban Lines Sold

The sale of the interurban lines of the Inland System, operating 180 miles of active trackage between Spokane, Wash., and Coeur d'Alene, Idaho, and between Spokane and Moscow, Idaho, to the Great Northern Railways was announced in Spokane on Dec. 3. Report

of the sale was confirmed by Major A. M. Anderson of the Great Northern staff. The sale will be subject to the consent of the Interstate Commerce Commission. The property consists of the Inland Empire Railroad, owning the Moscow line and the Spokane & Eastern Railway & Power Company, which leases the Coeur d'Alene line from the former company. M. J. Costello, western traffic manager of the Great Northern, is arranging with the city to make physical connections of the properties in order that Inland operations may center at the large Great Northern depot.

If the permission of the commission is secured the deal will be made retroactive to Dec. 1, with actual operating management beginning about Dec. 10.

Street railway properties of the related "Inland" and traction companies were merged three years ago into the new Spokane United Railways, and the power station at Nine Mile was sold last year to the Washington Water Power Company. The Great Northern purchase will complete the transfer of all the former properties of the system.

Engineers Public Service Reports on Financing

In a report sent recently to stockholders the Engineers Public Service Company outlines its progress and gives data on the results of the financing effected by the sale of allotment certificates.

To provide a portion of the funds necessary to acquire more than two-thirds of the common stock of the Virginia Electric & Power Company, Richmond, Va., and finance the acquisition of other properties operating in the Virginia district common stock and 50 per cent paid allotment certificates were sold in July, 1925. The company issued 109,957 shares of 7 per cent preferred stock and 500,000 shares of common stock and had a floating debt of \$3,500,000 on July 31, 1925.

Since that time the company has acquired nearly all the minority common stock of the Virginia Electric & Power, the controlling interest in the Eastern Texas Power & Light Company, the El Paso Electric Company, the Savannah Electric & Power Company, the Baton Rouge Electric Company and the Key West Electric Company. The company now has no floating debt and has about \$5,000,000 additional assets in securities and cash.

Outstanding stock at the close of business Nov. 20, 1926, totaled 204,297 3-12 shares of 7 per cent preferred and 778,938 shares of common stock.

Changes Effected in Alton Properties

The St. Louis & Alton Railroad, which has taken over the old Alton, Granite & St. Louis traction line, extending from Alton, Ill., to St. Louis, Mo., with a branch line from Mitchell to Edwardsville, Ill., has been granted a charter to do business by Secretary of State Emerson of Illinois.

The Alton Railway, Alton, Ill., which has taken over the Alton city lines, has increased its capital stock from \$500,000 to \$750,000.

Detroit Street Railways Must Pay Income Tax

Notice has been received at the office of the Detroit (Mich.) Corporation Counsel that the Department of Street Railways must pay federal income taxes as a corporation and that employees of the department must pay income taxes as individuals. The ruling was forwarded to the municipal office by the local collector of internal revenue.

A test case was started in 1923 when the government contended that Department of Street Railways employees must pay federal income taxes. The judge in the local federal court held that the municipal railway was exercising a governmental function and that the income tax law did not apply to its employees.

The case was appealed to the U. S. Supreme Court by the Department of Internal Revenue, but before the Supreme Court could act the provisions of the income tax law as it applied to such employees were rescinded by an act of Congress. The case was then considered closed, but the act of Congress applied only to taxes to be paid prior to 1925. The Commissioner of Internal Revenue has recently ruled that municipally owned public utilities were proprietary functions, and not governmental, and as such were taxable the same as any private business, and that employees of such utilities were subject to income tax. This ruling applies for 1925 and 1926.

The local collector has been instructed by the Internal Revenue Department to collect the taxes from city employees and the city. The collector cited that if the city and its employees show a willingness to co-operate an early collection of the taxes for 1925 may be anticipated. In case of failure to comply with the regulations on the part of the city or its employees procedure will be as in the case of other income tax payers. A reasonable time will be allowed in which to pay taxes.

Rate of Return a Stumbling Block in St. Louis

The reorganization committee of the United Railways, St. Louis, Mo., which has formed the St. Louis Public Service Company to take over the property when the receivership ends, seeks a 7 per cent return on the valuation fixed by the Public Service Commission, while Mayor Miller has expressed the belief that 6 per cent is enough under the service-at-cost franchise arrangement intended to be put into effect.

This point and the question of how the company should liquidate the old mill tax judgment and the current mill tax and existing franchise taxes are apparently the only things really in the way of an immediate termination of the receivership.

In a talk before the St. Louis Chamber of Commerce on Nov. 24 Mayor Miller declared that he was anxious to have the railway problem settled by completion of the reorganization so that the city could obtain the kind of service to which it is entitled. He refrained from further mention of the points at issue.

The valuation of slightly more than \$51,000,000 as of 1919 set by the state commission brought up to date would entitle the company to earn a net return on approximately \$56,000,000.

Foreclosed Ohio Interurban to Continue

Property of the Cincinnati, Lawrenceburg & Aurora Electric Street Railroad Company, offered for sale at foreclosure on Dec. 1, was purchased by the Union Trust Company, as trustee for the bondholders, for \$205,000, which was \$5,000 in excess of the upset price fixed by the Common Pleas Courts of Hamilton County, Ohio, and Dearborn County, Indiana. C. H. Deppe, president of the trust company and one of the two receivers for the interurban company, said that operation would continue under the supervision of the bondholders. Mr. Deppe also said that a new corporation would be formed before the first of the year. The interurban operates between Anderson's Ferry and Aurora, Ind., a distance of 57 miles.

Would Abandon Portion of Line

The Lewiston & Frontier Railroad, leased by the Niagara Gorge Railroad, filed a petition recently with the Public Service Commission asking for the approval of declaration of abandonment of portions of its electric railway in the village of Youngstown, Niagara County, and adjoining towns in New York.

The petition states that for more than two years passenger service has not been furnished to and into the village of Youngstown, such service having been discontinued with the consent and approval of the village officials on the commencement of operations by the Gray Bus Line.

The right-of-way of the electric railway has been used occasionally for operating freight cars for the delivery of coal to the U. S. Government Reservation. Such operations, however, the company states, have been at a loss. In addition, the pavement on Main Street is in need of reconstruction and when done, would impose a large capital expenditure on the railway thus increasing the value of its property devoted to public service without prospect of any return being realized from the operation of the road.

Key Route to Issue \$1,500,000 in Bonds.—The Key System Transit Company, Oakland, Cal., plans the issuance and sale of \$1,500,000 of first mortgage 6 per cent bonds to the National City Company partially to finance a \$9,000,000 reconstruction and improvement program, provided approval is obtained from the State Railroad Commission.

Dividend Deferred.—The directors of the Interborough Rapid Transit Company, New York, N. Y., deferred action on the quarterly modified guaranteed dividend of \$1.25 of the Manhattan Elevated owing to the fact that it was not earned in the September quarter. This disbursement is determined by the earnings for the third quarter of each year under the terms of the Interborough-Manhattan readjustment plan of 1922.

Book Reviews

Arc Welding—The New Age in Iron and Steel

By the Lincoln Electric Company, Cleveland, Ohio. 160 pages. \$1.50.

Devoted largely to the use of arc welding in general production manufacturing, but giving knowledge of arc welding principles and equipment now available, the new book on arc welding by the Lincoln Electric Company is most comprehensive. It contains more than 200 illustrations of products which are manufactured by arc welding. In addition there are numerous diagrams and charts showing welding speeds and costs.

The use of arc welding in place of riveting is discussed thoroughly, and a chapter is devoted to the field for arc welding by substitution of arc welded steel for cast iron. The discussion shows how to go about redesigning cast iron for manufacture in steel and illustrations are given to show where this is being done commercially.

The opening chapter discusses the superiority of steel over cast iron from both the standpoint of strength and economy. One chapter is devoted to automatic arc welding and there are numerous illustrations showing products welded automatically.

The book is 6 in. x 9 in. It is bound in imitation leather.

Trade Agreements 1925

United States Department of Labor, bureau of labor statistics, Washington, D. C. 152 pages. 25 cents a copy.

This pamphlet devotes eleven pages to extracts from certain agreements between electric railways and the Amalgamated Association. The properties mentioned are the Community Traction Company, Toledo, Ohio; Memphis Street Railway, Memphis, Tenn.; Illinois Power & Light Corporation applicable to its railway department in Bloomington and Normal, Ill.; Trenton & Mercer County Traction Corporation, Trenton, N. J.; Chicago, Aurora & Elgin Railroad, Wheaton, Ill., and the Salem and Amesbury divisions of the Massachusetts Northeastern Street Railway.

Guiding Principles of Public Service Regulation

Henry C. Spurr. Public Utilities Reports, Inc., Rochester, N. Y., and Washington, D. C. 919 pages.

Under the heading "Returns to which Utilities are Entitled" Mr. Spurr begins the third volume of his work on the principles involved in the laws affecting utilities. He then takes up the subject of fair or reasonable return, attraction of capital, efficiency in management and service, miscellaneous factors affecting returns. From the broad subject of a consideration of factors in rate making he shows these factors in specific utilities—water, gas, electric, street railway, interurban railway and telephones. A discussion of street railway rates consumes 47 pages, dealing principally with electric railway appor-

tionment in general and then taking up the apportionments between different branches, different lines, interurban and suburban business and freight and passenger business. There is included a discussion of the 5-cent fare, the 6-cent fare, the 7, 8 and 10-cent fare. In connection with fares reference is made to the statistics furnished by the American Electric Railway Association on average cash fares in American cities. The book also explains the status of interurban railway rates. The text is based on court and commission decisions and is elaborated by a table of the various cases cited. Some 52 pages make up a carefully prepared index.

Business Annals

By Willard Long Thorp. National Bureau of Economic Research, Inc. New York. 380 pages. \$4.

Particularly at this time, when so many persons hold to the view that the present is a period of inordinate prosperity in the United States, is this sobering volume of interest not only to manufacturers but to railway men. Economic changes that affect the one affect the other despite the fact that the extent of the consequences of any change in the economic status may vary greatly as between two lines of business activity.

Problems are not solved by shutting the eyes to them. Yet that is done far too often in the case of economic questions despite the professed desire to be fortified with the facts for dealing with each occasion as it arises. And here are the facts. They should not be ignored just because they are likely to be sobering in their influence by restoring a sense of perspective. In this work of 380 pages the author has presented in descriptive form the business cycle history of seventeen countries in all quarters of the world for periods ranging from 36 to 136 years. It is probably the most comprehensive survey of the world's experience with business booms and depressions which has ever been made. In the report are answers to such questions as: When have periods of depression begun? How long have they lasted? What brought the depressions? When have revivals of activity occurred? How have these revivals progressed? How are the different branches of business related? How are different countries related?

Simultaneously with their collection, these facts have been analyzed by Dr. Wesley C. Mitchell. His deductions are contained in the introductory section, entitled "Business Cycles as Revealed by Business Annals."

The information is believed by the publishers to be the latest and most authoritative on the occurrence of business cycles and on the duration of periods of prosperity and depression. It is the first collection of its kind assembled for Dr. Mitchell's use since publication of his first studies in 1913.

It is expected that "Business Annals"

will be followed at short intervals by other reports under the direction of Dr. Mitchell. These reports will provide a thoroughgoing analysis of the facts regarding fluctuations in business.

The bureau is its own publisher. It aims to distribute its reports at prices just sufficient to cover publication expenses, all the research costs being defrayed from contributions to the bureau's general funds.

Mundy's Earning Power of Railroads, 1926

Compiled and edited by Floyd W. Mundy. J. H. Oliphant & Company, New York, N. Y. 535 pages.

In this 21st issue of this annual publication data and statistics are given on 127 railroads relating to their earning power and to their securities arranged in convenient form for ready reference. Practically all the important railroads in the United States are included. Some introductory chapters explain to the investor general principles which must be applied in determining the value of the stocks or bonds of any railroad. The many tables with data on mileage, expenses and other items afford ready comparison and notes expand the information.

The Indeterminate Permit, In Relation to Home Rule and Municipal Ownership

By Delos F. Wilcox, Ph.D. Published by the Public Ownership League of America, Chicago, Ill., as "Bulletin 35." Paper, 99 pages. \$2.

The thesis on which this book is written is that when the indeterminate permit for utilities was invented in 1907, and for some years later, it looked like a very desirable plan, but that experience shows it is not so desirable as it at first appeared to be. The only safe policy is municipal ownership and operation. The trouble with the indeterminate permit, in the opinion of Dr. Wilcox, is that it depends ultimately for success on satisfactory public control and the right of the public to terminate the permit for cause. The author believes that both state regulation and the right to terminate a terminable permit have broken down, and this form of franchise now gives utilities "an indefinite lease of life without requiring them ever to come back to the municipality for an accounting of their stewardship and without giving the municipality any effective power to cut their lease of life short. Under the indeterminate permit, the companies are in to stay, and their good or ill behavior has little or nothing to do with it." This theory is developed in the 99 pages of the book.

Railway Statistics of the United States of America

Prepared by Slason Thompson, Bureau of Railway News and Statistics, Chicago, Ill. Tucker-Kenworthy Company, Chicago. 148 pages.

Here is a comparison of steam railway statistics for the year ended Dec. 31, 1925, with the official reports for 1924, as well as recent statistics of foreign railways. This is the 23d year of the publication of this booklet. The usefulness of this pamphlet is enhanced by maps, tables and illustrations.

Personal Items

F. S. Elliott to Superintend Inland Empire for New Owners

F. S. Elliott, general superintendent of the western division of the Great Northern Railway, has been made general superintendent in charge of operation of the Spokane & Eastern Railway & Power Company and the Inland Empire Railroad, electric interurban properties in the Spokane district purchased by the Great Northern. Mr. Elliott and M. J. Costello, traffic manager of the Great Northern, western division, are engaged in the negotiations incidental to merging the former Inland system into the Great Northern organization. So far Mr. Elliott is the only Great Northern official designated for appointment to the Inland System by the new owners. The personnel of the Inland will not be merged into the Great Northern system until the Interstate Commerce Commission approves the transfer of the interurban properties to the transcontinental line, an action hoped for late this month.

Following the war Mr. Costello was operating head of the Inland, but the property was returned to the bondholders in 1919. In fact, the Great Northern owned the Inland system jointly with the Northern Pacific from 1911 to 1918, during which time it was under the Spokane, Portland & Seattle, in which both the steam railroads were interested. The Inland is now purchased by the Great Northern alone. W. P. Johnston has been general manager. He succeeded F. E. Connors and Waldo G. Paine, both deceased. With permission of the Interstate Commerce Commission the sale will be effective as of Dec. 1.

C. M. Griffith Made Vice-President of Wharton Company

Charles M. Griffith, long associated with William Wharton, Jr., & Company, Easton, Pa., has been elected vice-president of the company. Mr. Griffith has back of him a wealth of experience in railway work, but counts as his choicest experience during his long association with the company his acquisition of so many good friends and acquaintances. He has looked with more or less composure on the rise of the bus recently, for years ago, when he was just cutting his experience teeth in business, he was secretary of the Omnibus Company, General, Philadelphia. This was in the day of the three-horse, double-deck passenger buses on Broad Street. With him recollections of these days, remote now to many others who lived through them, remain alive as reminiscences of history in the process of repeating itself.

Mr. Griffith has served in various capacities with William Wharton, Jr., & Company, Inc., and its associated interests since the days of flat tram rails and cast iron special work. When the Wharton company rolled its own girder

rails and T rails at the mill's of the North Branch Steel Company at Danville, Pa., Mr. Griffith acted as secretary and buyer of that company. More recently he has been sales manager of the Wharton company as well as a member of the board of directors of that company, the Philadelphia Roll & Machine Company and the Tioga Steel & Iron Company.

Melvin A. Traylor Elected to General Electric Board

Melvin A. Traylor, president of the First National Bank, Chicago, was elected a director of the General Electric Company at a meeting of the board in New York on Nov. 24. He is well known to electric railway executives, particularly in the Central West, and was one of the speakers at the convention of the American Electric Railway Association in 1923.

In addition to his executive position with the First National Bank Mr. Traylor is a director of the Stock Yards National Bank, Chicago; of Fairbanks, Morse & Company, Chicago, and of Austin Nichols & Company, New York. He is also a member of the advisory committee of the Central Manufacturers District Bank of Chicago and chairman of the finance committee of the National Wool Warehouse & Storage Company.

Mr. Traylor was born in Breeding, Ky., on Oct. 21, 1878. He studied law at night and was admitted to the Texas bar in 1901. In 1922 the honorary degree of master of arts was conferred on him by the University of Illinois. He is a trustee of Northwestern University and the Newberry library, and during the war served as director of sales of United States treasury certificates of indebtedness for the seventh federal reserve district.

He is a member of the American Bankers' Association, the Illinois Bankers' Association, the American Economic Association, Southern Society of Chicago and Art Institute of Chicago.

Changes in Staff of California Commission

Charles Grunsky has been appointed gas and electric engineer of the Railroad Commission of California, to succeed A. V. Guillou, promoted to be assistant chief engineer. J. G. Hunter, transportation engineer, has been appointed to succeed A. C. Mott, who has been appointed chief engineer of the commission to succeed Lester S. Ready. The new officials will assume their positions immediately.

Mr. Grunsky has been with the commission since 1914. He was employed on valuation work up to 1922, and, for the major portion of the time since 1922, as an assistant engineer in the gas and electric division. He is a graduate of the University of Califor-

nia and engaged in construction work for a year before entering the employ of the commission. During the World War Mr. Grunsky went overseas and, after the armistice, he returned as a captain in the engineer corps.

J. G. Hunter entered the employ of the commission in April, 1920, worked as an assistant engineer part of the time in the hydraulic division and, since 1923, in the transportation division. Since 1924 he has represented the transportation division in the Los Angeles office of the commission. Mr. Hunter is a graduate of the University of Utah, was employed for a number of years in the office of the city engineer at Portland, Ore., and, later, in the U. S. Geological Service.

As noted recently in the *ELECTRIC RAILWAY JOURNAL*, Mr. Ready has been made president of the Key System Transit Company, Oakland, Cal.

D. A. Smith Assistant General Manager at Detroit

Del A. Smith, general superintendent of the Detroit Department of Street Railways, Detroit, Mich., was appointed assistant general manager by the Street Railway Commission on Dec. 7, and will assume the title of acting general manager after the resignation of H. U. Wallace as general manager becomes effective on Jan. 1. Mr. Smith will be acting general manager until a new general manager is appointed.

The appointment of the new assistant general manager was made at a meeting in the Mayor's office at which G. Ogden Ellis, president of the commission, and Commissioners John J. Barlum and H. H. Esselstyn were present. Mr. Smith succeeds as assistant general manager H. M. Gould, who resigned about a year ago.

It has been announced that several applications have been received for the position of general manager from men not now employed by the department. This fact will not bar men already in the service from receiving consideration in filling the vacancy made when Mr. Wallace's resignation goes into effect.

Mr. Smith started his 22 years of experience in the train service of the Chicago, Milwaukee & St. Paul Railroad in Chicago in 1904. The following year he became a conductor on the Jackson Division of the Detroit United Railway. He was made a carhouse foreman in 1907, and since then has occupied the positions of assistant division superintendent, night superintendent, division superintendent, assistant superintendent of transportation and general superintendent. At the time the Detroit United Railway lines were purchased by the city, Mr. Smith was taken into the employ of the municipal system.

Charles L. Sheldon, formerly chief engineer at the power plant of the Holyoke Street Railway, Holyoke, Mass., has entered the employ of the Holyoke Water Power Company. Electric energy to operate the Holyoke Street Railway system was supplied for the first time by the Holyoke Water Power Company on Dec. 5.

W. G. Gove Railroad Club President

Superintendent of Equipment at Brooklyn Third Electric Railway Executive to Hold This Office

William G. Gove, superintendent of equipment of the Brooklyn-Manhattan Transit Lines, has been elected president of the New York Railroad Club. He is the third electric railway man in the history of the organization to be elected to that post. The two others who have served in that capacity are H. H. Vreeland, now of the Interborough Rapid Transit Company and formerly president of the Metropolitan Street Railway, New York, and Frank Hedley, president and general manager of the Interborough Company.

Mr. Gove became connected with the companies in Brooklyn in 1903. Since then the character of much of the service rendered over the lines there has changed tremendously. At the time he



W. G. Gove

went to Brooklyn steam train operation on the elevated had just been replaced by electric and the equipment offered a large field for the standardization of parts on the electric trains. In fact, the standardization of widely varied equipment was the first object of his work in Brooklyn. It was accompanied by drastic changes in the organization whereby the all-around shops intended for territorial operation were replaced by specialty shops for the entire system. This work of standardization of the elevated cars and equipment was undertaken on Jan. 4, 1904, but was preceded by a six months study of the problem and much preliminary work. The task was practically ended in 1906. Mr. Gove's next important work was to standardize the cars of the surface lines. This phase of the work was completed in 1910. During this time 3,425 cars were reconstructed at a cost of more than \$4,000,000 and 626 cars were purchased at a cost of \$10,000,000. During this interval 704 single-track cars were withdrawn from service.

This was a gigantic task. Its completion with the celerity with which Mr. Gove carried out the work would have been impossible to any man less capable as an organizer. In prosecuting the work Mr. Gove assembled one of the finest maintenance organizations

in the world. It was here that the man's organizing ability asserted itself. He knows how to delegate authority but he also has the faculty of keeping closely in touch with all that is going on. His work is directed through his various assistants.

In a changing world, Mr. Gove was not content with revamping equipment and keeping things going. He threw himself into the field of development and original design, and was responsible, among other things, for developing, with the assistance of his associates, the present New York municipal subway and elevated cars, copied throughout the world as models for equipment intended for use in rapid transit service. Articulated units for train operation were a later development. In them novel features never before attempted in car construction were embodied. The low-level center-exit and entrance cars, so long a standard on the Brooklyn surface lines, were also brought out. In addition to all this, Mr. Gove was a pioneer in adopting steel wheels for electric railway service. More recently he has been engaged in directing plans for equipping the new Coney Island shops, the largest of their kind in the world and certainly the most completely equipped. His record in association work, particularly his work in the interest of the American Electric Railway Association, is well known, he being a past-president of the Engineering Association.

Before he joined the Brooklyn Rapid Transit system in 1903 Mr. Gove was with the Boston Elevated Railway. He was born in Cincinnati on Feb. 24, 1874, and was educated in the Cincinnati schools and at the Cincinnati School of Technology, which is now a part of the University of Cincinnati. Immediately after leaving the university he began work in a civil engineer's office and later was engaged in an irrigation project on the Pacific Coast. In July, 1896, he became assistant engineer of roadway for the Cincinnati Street Railway. His connection with the Boston Elevated Railway dated from March, 1899. His title at Boston was assistant engineer. From January, 1900, to May of the same year Mr. Gove had charge of reconstructing the equipment of the trial trains in competitive tests in the old Tremont Street subway, used by the elevated railroad, and by surface cars during the early morning hours when traffic was light. These tests of train operation marked an epoch in electric railway development, as they pointed the way to train operation with multiple-unit equipment. After the tests had been completed and a decision reached as to the type of equipment to be tested, Mr. Gove was associated with Messrs. Winsor and Lindall in constructing and equipping additional cars for this service. As noted previously, he went from Boston to Brooklyn in 1903.

J. Paul Thorne has assumed his new duties as safety director of the Monongahela West Penn Public Service Company, Fairmont, W. Va. Since the resignation of the former director, James E. Hendry, the assistant director, has been in charge of the movement.

William B. McKinley

**Former Head of Illinois Traction System Dies at Age of Seventy—
Had Lately Been Illinois Power & Light Chairman**

SENATOR WILLIAM B. McKINLEY, utility magnate, banker, world traveler, economist, philanthropist and politician, died at the Homelawn Sanitarium in Martinsville, Ind., on Dec. 7. Mr. McKinley's death had been expected for several weeks as he had been suffering with an incurable illness for many months. The remains will be taken to Indianapolis and sent to Champaign, Ill., his former home, for burial.

Though known to many for his charity and for the influence he wielded in politics, he was especially prominent in business circles for his activities in various utility enterprises. One of the most noteworthy of these was his affiliation with the Illinois Traction Company, whose many subsidiaries cover Illinois, Iowa, Kansas and Missouri. A few years ago he disposed of a large part of his holdings in the company, but was made chairman of the board of the Illinois Power & Light Corporation. The McKinley interests, of which he was the head, controlled 500 miles of track, with its own bridge across the Mississippi River at St. Louis and a terminal in the heart of the city. This was the high spot in a utility career which began in 1884, when Mr. McKinley was 28 years old. He saw great possibilities in the mule car line operating between Banner and Champaign, a distance of 2 miles, and interested Eastern capitalists in the matter and bought the road. Under his auspices the property was electrified and extended. Later he bought the interurban line between Springfield and Defiance, Ohio, and still later the utility property at Bay City, Mich. Then he turned his attention to the Danville system. These properties became the nucleus around which grew the powerful Illinois Traction System, one of the most important of the early utility groups with properties in several states serving a vast population with electric railway, electric light and gas service.

MAN OF WIDE INTERESTS

In addition to his utility endeavors, he had been for a number of years a deep student of political questions and of economics and had made himself an authority on matters involving foreign relations. He had traveled very extensively and had gained an accurate conception of conditions in various parts of the world. Some years ago, accompanied by a party of friends, he went on a trip around the globe, spending a considerable time in each of the principal foreign cities.

Senator McKinley had been frequently before the limelight in spite of his quiet ways. In 1920 he scored an overwhelming victory over his Democratic rival for United States Senator from Illinois. His election and nomination were a great personal triumph for he was the only opponent of the state political machine of Mayor Thompson of Chicago to win a nomination at the primary election held some

time before that. This election came as a climax to a long political career. He was elected to the House of Representatives in 1904 and served continuously until 1912. He was returned to the House in 1914, where he continued until 1920, when he was elected to the Senate. In the primaries this year he was defeated by the present Senator-elect, Col. Frank L. Smith, over whom he had triumphed six years ago. He entered this contest with his accustomed vigor, but the strain of the campaign is believed to have enfeebled him greatly. His defeat in the primary came on the heels of the Senator's vigorous stand in favor of American adherence to the world court protocol and brought to a close a Congressional



William B. McKinley

career of twenty years, fourteen of which were spent in the House of Representatives.

Mr. McKinley was born in Petersburg, Ill., on Sept. 5, 1856. When he was a very young lad his family moved to Champaign, where his father was the pastor of a small Presbyterian congregation. He entered the University of Illinois, but after two years left to become a clerk in a drug store. Later he worked in a similar capacity in a real estate office. Following a short banking experience, he became associated with his uncle, J. B. McKinley, in the farm loan business, branching out in 1884 to enter the utility field.

At the time of the panic in 1893 Mr. McKinley had considerable money invested in farm mortgages in Kansas and disposed of most of the utilities which he had bought. Three years later, however, he re-entered the public utility field by building an 11-mile electric railway to Joliet. Within the next three years he bought and modernized the street railway lines in Quincy and Galesburg and constructed

an interurban railway to Knoxville. Having accumulated a large fortune after knowing in his youth and boyhood the hardships of life and later the uncertainties of all forms of business, Senator McKinley was very generous in the time of his prosperity to educational and other institutions designed to assist struggling youth. Nor were his benefactions confined to the large gestures of philanthropy. According to C. A. Willoughby, his secretary, in the last eight or ten years he probably donated between \$10,000,000 and \$12,000,000 to public and private charities. This takes no account of his personal generosity.

T. W. Shelton

Thomas William Shelton, general manager and purchasing agent of the Illinois Central Electric Railway, Canton, Ill., died on Nov. 15. He had been affiliated with the Canton properties since 1918, when he resigned as general superintendent of the Kankakee & Urbana Traction Company, in Urbana, to accept the general superintendency of the Canton road.

Mr. Shelton had been engaged in electric railway and electric lighting work for approximately 38 years. His first railway connection was with the old Brooklyn Street Railway in Cleveland, where he remained ten years. Two years service followed with the Indianapolis Street Railway. Next he became associated with the Northern Ohio Traction & Light Company, now the Northern Ohio Power & Light, where he served from 1900 to 1904. He aided in the construction of the line of the Fort Wayne & Springfield Traction Company between Fort Wayne and Topeka and served the company both as mechanical and electrical engineer. In 1908 he went to the Indianapolis, Columbus & Southern Traction Company, Columbus, Ind., as master mechanic. Two years later he entered the service of the Illinois Traction System under E. D. Bell, general superintendent of the St. Louis business of the company. Thence it was he went to Urbana, where he was to remain about five years. Mr. Shelton was born in Ontario, Canada, in 1861.

Thomas C. Coleman, head of T. C. Coleman & Son, railway supplies, died recently in Louisville, Ky.

Henry J. Arnold, one of the organizers of the Durango Street Railway and a promoter of the western slope's first electric railroads, died at Denver on Nov. 22, aged 60. Mr. Arnold was a native of Clinton, Mo. He settled in Colorado in 1880. He was a director in many business concerns and an untiring worker for the advancement of the civic beauty of Denver, of which he was at one time Mayor.

Charles F. Morse, identified with the promotion of the Kansas City Belt Railway, died in Boston, Dec. 1. Mr. Morse was a former officer of the Metropolitan Street Railway, Kansas City, Mo., a predecessor of the Kansas City Railways and the Kansas City Public Service Company. He was 87 years old.

Manufactures and the Markets

News of and for Manufacturers—Market and Trade Conditions
A Department Open to Railways and Manufacturers
for Discussion of Manufacturing and Sales Matters

It Isn't Too Early to Think About the Cleveland Exhibit

Plan now for your convention exhibit at the A.E.R.A. show in Cleveland next October! Freddie Dell, director of exhibits, is already under way on his program. His first release was issued under date of Dec. 4. Next October may seem to be a long way off, but the present is budget time for 1927, and to be forewarned is to be forearmed.

While exhibit facilities at Cleveland last year far surpassed those available in other cities, the Cleveland convention committee, Col. J. H. Alexander chairman, has assured the association that these facilities will be much improved for the coming convention.

The fact has been stated before, but it might be well to reiterate, that the exhibit will take place in the Cleveland Public Auditorium and the Auditorium's west wing, both buildings being required to accommodate the display.

The exhibit feature of the convention has grown in importance each year. The space occupied by exhibits at the last convention totaled more than 119,000 sq.ft. Ninety-seven buses and chassis were on display. Forty-one street and interurban cars were shown, and in addition many important accessory concerns displayed products of interest to the transportation industry. There were 271 exhibitors in all.

Diagram of the exhibition spaces will be available for distribution to the membership on June 1, 1927, together with applications for space.

The dates of the convention, by the way, are Oct. 3 to 7.

New Coaches in Service in Atlanta

Ten new single-deck de luxe coaches were placed in commission on Nov. 29 to supplement the present coach service to Morningside and the Virginia-Highland Avenue sections of Atlanta by the Atlanta Coach Company, a subsidiary of the Georgia Railway & Power Company. The new coaches seat 21 passengers, and as they are smaller than the double-deck coaches now in use and considerably more flexible in traffic they are expected to provide improved service for patrons on the two routes.

The color scheme of the new coaches is flamingo red and cream, with black trimming, similar to the double-deck coaches in use. Entrance and exit are from the front of the coaches and they are equipped with a six-cylinder, sleeve-valve motor. Each coach is upholstered in real brown leather and finished in the interior with mahogany. The floor is covered with green battleship linoleum and each coach is equipped with four hydraulic brakes, as well as an emergency hand brake. A feature of

the new coaches is the lighting system, consisting of eight dome lights. A heating and ventilation system forms a part of the construction.

The new coaches were manufactured by the Yellow Coach Manufacturing Company.

Jury for Harvard Advertising Awards

Dean Donham of Harvard Business School Names Twelve Jurors to Make Awards for Year 1926

The jury to decide the 1926 winners of the Harvard Advertising Awards, the series of annual prizes founded in 1923 by Edward Bok, has been announced by Dean Wallace B. Donham of the Harvard Business School, through which the awards are administered. The jury will convene in Boston the middle of January to make the awards for the year 1926.

The following awards for 1926 will be made: Prizes of \$2,000 each, for the most excellent national campaign, for the most excellent campaign of industrial products, for the most excellent local campaign, and for the best campaign executed locally in cities of 100,000 population or less; a prize of \$2,000 for the advertising research most conspicuous for bringing about economy or precluding waste; four prizes of \$1,000 each for the advertisements most effective in the use of text, in the use of pictorial illustration, in the combination of text and illustration, and in the use of typography, respectively.

In addition a gold medal will be awarded to the individual or organization deemed by the jury of awards to merit recognition for distinguished con-

temporary services in the field of advertising.

All material to be submitted for the awards for 1926 must be in the hands of the Harvard Business School on or before the last day of this year.

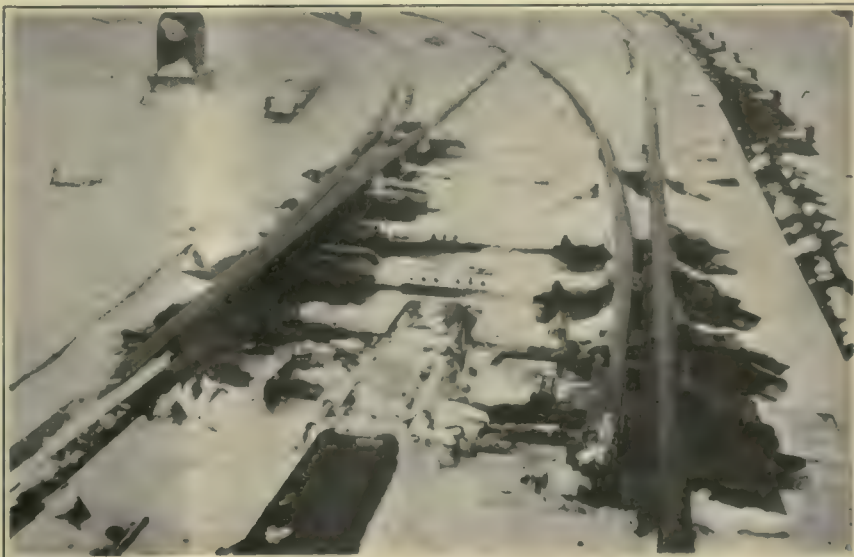
Those who will serve on the award jury are: John Benson, of Benson & Gamble, Chicago, advertising agency; S. E. Conybeare, assistant sales manager of the Armstrong Cork Company, Lancaster, Pa., and president of the Association of National Advertisers; F. C. Kendall, editor of *Advertising and Selling Fortnightly*, New York; W. D. Moriarity, professor of economics University of Southern California, Los Angeles; A. C. Pearson, treasurer of the United Publishers Corporation, New York; Harford Powel, Jr., editor of the *Youth's Companion*, Boston; Louis Wiley, business manager of the New York Times, and Prof. Melvin T. Copeland and Assistant Prof. Neil H. Borden of the Harvard Business School.

A special jury to make the award for the advertisement most effective in the use of typography has also been appointed, to consist of Joseph M. Bowles of the William Edwin Rudge Company, New York printing house; Everett R. Currier, president of Currier & Harford, Ltd., New York, and D. B. Updike of the Merrymount Press, Boston.

Efficient Track Switch Heater Developed

A new track switch heater, developed and placed in service by the Westinghouse Electric & Manufacturing Company, is said to aid greatly in helping to solve the problem of keeping the switches open on steam railways and rapid transit systems during severe winter weather.

The heaters are dropped between the ties close about the switch so that there is about 1 in. to 1½ in. between bottom of rail and top of heater, one heater being placed in front of the switch blade. After once installed they can be left for the winter in continuous service with only occasional inspection. They may be hooked up 14 in series across 660 volts, or coupled



Switch Heater Operating Under Severe Weather Conditions

in other arrangements depending upon voltage.

This switch heater is easily accessible for maintenance and installation and is so designed as to prevent moisture from entering the interior of the heater.

Bids for Philadelphia Car Equipment Opened

Three bids were opened on Dec. 3 by Director Ehlers for electrical equipment of cars for the Broad Street subway, Philadelphia, Pa. There are 312 separate equipments for the 150 cars being built by the J. G. Brill Company.

The American Brown Boveri Company, Camden, N. J., was low bidder at \$741,000. Next to it was the Westinghouse company, \$776,566, and the high bidder was the General Electric Company, \$811,200. Director Ehlers said he would announce the award later.

Sesqui Medals Awarded Westinghouse Company

The executive jury of awards of the Sesqui-Centennial International Exposition at Philadelphia voted to the Westinghouse Electric & Manufacturing Company nine awards for its exhibits, including a grand prize for "Excellence of products and service to humanity." Other than the grand prize, the awards include one medal of honor, four gold medals and three silver medals.

\$500,000 Seattle Terminal Approved

The City Council of Seattle, Wash., has passed, without a dissenting vote, the ordinance granting the Pacific Northwest Traction Company the necessary franchises to move its Everett interurban terminal to a new location on Stewart Street, where a \$500,000 building will be erected. A. W. Leonard, president of the Puget Sound Power & Light Company, parent concern, states that work will begin at once. The traction company operates an interurban line from Seattle to Everett, a bus line from Everett to Mount Vernon and another interurban line connecting Mount Vernon and Bellingham, all of which will be served in the new terminal building.

Metal, Coal and Material Prices

Metals—New York		Dec. 7, 1926
Copper, electrolytic, cents per lb.	13.35	
Copper wire, cents per lb.	15.75	
Lead, cents per lb.	7.90	
Zinc, cents per lb.	7.35	
Tin, Straits, cents per lb.	69.50	
Bituminous coal, f.o.b. Mines		
Smokeless mine run, f.o.b. vessel, Hampton Roads, gross tons	\$7.00	
Somerset mine run, Boston, net tons	3.00	
Pittsburgh mine run, Pittsburgh, net tons	2.20	
Franklin, Ill., screenings, Chicago, net tons	1.75	
Central, Ill., screenings, Chicago, net tons	1.525	
Kansas screenings, Kansas City, net tons	2.30	
Materials		
Rubber-covered wire, N. Y., No. 14, per 1,000 ft.	\$6.00	
Weatherproof wire base, N. Y., cents per lb.	17.50	
Cement, Chicago net prices, without bags	2.10	
Lined oil (5-bbl. lots), N. Y., cents per lb.	11.4	
White lead in oil (100-lb. keg), N. Y., cents per lb.	14.75	
Turpentine (bbl. lots), N. Y., per gal.	\$0.90	

The franchise ordinance has been pending in the City Council since July 19. Some weeks later the project was delayed when the City Council returned the matter to the committee on franchises. It extends from Dec. 31, 1934, to Dec. 31, 1950, and authorizes the company to build a double track extending from its present terminal on Stewart Street to the new building site, two blocks away. Under the present franchise the company pays the city 10 cents a car-mile for use of the tracks. Under the new franchise the minimum charge will be 10½ cents and the maximum rate 15 cents during the period of the sixteen-year extension. An amendment to the bill provides for an additional car-mile charge in the event the city builds either an elevated or subway line over any of the route used by the railway.

Car Contracts Awarded in San Francisco

Contracts for the construction of fifteen new cars for use on the lines of the Municipal Railway have been let by the Board of Works of San Francisco. These cars are to be delivered in six months time and are to cost, exclusive of engineering and inspection, \$18,500 each.

At the office of the city engineer it was said that the cars are badly needed, as the number of passengers is increasing daily. Present cars will not be retired as none of these has as yet outlived its usefulness.

The Municipal Railway management requested the new cars more than a year ago, but it was not until Nov. 26 that the final approval of the request was granted.

These fifteen cars will be of the modified California semi-steel type, each with a seating capacity of 52. Contracts for the new cars have been let as follows: Brakes, Westinghouse Traction Brake Company; motors, Westinghouse Electric & Manufacturing Company; trucks, J. G. Brill Company, and bodies, St. Louis Car Company.

Weight, total	51,250 lb.
Booster centers, length	20 ft. 10 in.
Length over all	47 ft. 1 in.
Truck wheelbase	4 ft. 10 in.
Width over all	9 ft. 3 in.
Height, rail to trolley base	11 ft. 5½ in.
Body	Semi-steel
Interior trim	Birch
Roof	Arch
Air brakes	Westinghouse SML
Armature bearings	Plain
Axles	Standard EB
Bumpers	Cast anti-climber
Car signal system	Hand-operated bell
Car trimmings	Bronze and aluminum
Center and side bearings	Brill type roller
Compressors	Westinghouse 16 ft
Conduits and junction boxes	Westinghouse
Control	Westinghouse H.C.
Destination signs	Hunter
Fare boxes	Johnson
Fenders	Eclipse life guard
Finish	Paint and varnish
Gears and pinions	Westinghouse
Headlights	Golden Glow
Journal bearings	Plain
Journal boxes	Brill
Motors	Westinghouse 306, outside hung
Sash fixtures	Stationary
Seats	Heywood-Wakefield
Seating material	Outside, slots; inside, veneer
Slack adjuster	Westinghouse type J
Step treads	Cast
Trolley base	U.S.-20
Trucks	Brill 76-EZ
Ventilators	Garland
Wheels	Rolled steel, 34 in.

Rolling Stock

Honolulu Rapid Transit Company, Honolulu, Hawaii, has changed its plans on a prospective order for twelve one-man cars, recommended by Richard Sachse, traffic expert, and referred to in the *ELECTRIC RAILWAY JOURNAL*, issue of Oct. 23, page 792. Instead, the company plans now to purchase eight new one-man, two-man cars at a cost of approximately \$136,000. This is in connection with its proposed rerouting and curtailment of service.

Rockford & Interurban Railway, Rockford, Ill., purchased recently at foreclosure by Milton Ellis, who had previously bought all the bonds in default, plans to buy five new cars as one of the first steps in a program of improvement intended to restore the earning power of the road.

Track and Line

Tampa Electric Company, Tampa, Fla., has started the work of constructing its double car lines on the newly acquired right-of-way for the extension of the Bay Shore Drive.

Memphis Street Railway, Memphis, Tenn., will extend the Faxon Avenue line, which at present is single track. It will be extended 2,000 ft. and double tracks will be put in.

Milwaukee Electric Railway & Light Company, Milwaukee, Wis., has extended its Holton-Mitchell Street line on Forest Home Avenue from 26th Avenue to the city limits near 29th Avenue at a cost of \$21,086.

New Advertising Literature

Mine Safety Appliances Company, Pittsburgh, Pa., has issued bulletin No. 231 on the M.S.A. paint respirator, a complete protection for paint sprayers.

American Brown Boveri Electric Corporation, New York, N. Y., has issued descriptive circular No. 702 on quick-acting automatic generator voltage regulators.

Ohio Brass Company, Mansfield, Ohio, has issued a folder called "Lighting the Way." It describes the Imperial headlights for electric railways.

Westinghouse Electric & Manufacturing Company, East Pittsburgh, Pa., has just released three new railway catalog sheets, Nos. 6, 7 and 8, containing descriptions and data on the latest types of railway motor covers, axle shields, gear cases and armature shafts, respectively. Leaflets 20,300 and 20,301, containing specifications for railway motors, have also been published. These motors are No. 510-E and 508-E, respectively, the first two standard railway motors on which dual ventilation has been used. In addition to the above publications, two folders, F-4,728 and DMF-5,005, have been issued describing the new type of compensating controller fingers designed to give maximum contact between finger and segment on type K railway controllers, with minimum failure from burning.



And also in Indiana Parlor Chair Buffet Car Service!

Believing that attractive, comfortable and fast transportation is essential for interurban service, the Indiana Service Corporation has just placed in operation seven cars with many conveniences previously to be found only in Pullman car service. Of these new units, two are parlor chair buffet cars and five are combined passenger, smoker and baggage coaches. They have been placed in service between Ft. Wayne and Indianapolis, a run of 140 miles.

Of course they are equipped with

PEACOCK BRAKES

Most modern cars, in every type of service are! They have many advantages which especially adapt them to modern car design—improved appearance of platforms—light-weight—minimum platform space occupation—three times the braking power of ordinary hand brakes—and many others.

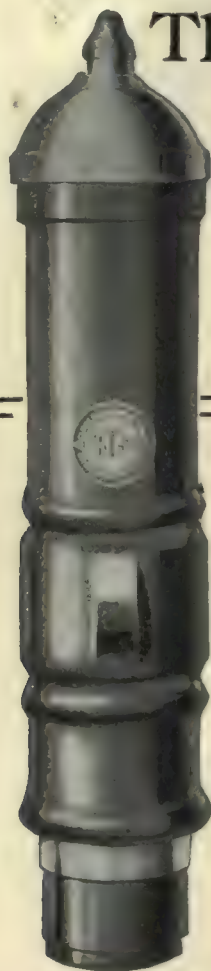
Facts and figures covering what they have done for others and what we know they will do for your cars will gladly be mailed on request.

NATIONAL BRAKE CO., Inc.

890 Ellicott Square, BUFFALO, N. Y.



Yes!



The Pennsylvania-Ohio Electric Co.
*which won the Charles A. Coffin
 Foundation Prize for 1926 use—*
GRUSS AIR SPRINGS

THE primary object of the founders of the Coffin prize is the stimulation of progress and development in the Electric Railway Industry.

The briefs submitted were on the basis of six general classifications.

"The success in gaining Public Good-Will" was classification No. 1.

Bus transportation officials know to-day that Gruss Air Springs definitely and positively help to build public Good-Will because they insure a supreme riding comfort impossible to obtain by any other means, or type of equipment.

Classification No. 3 was for improvements in construction practice which have resulted in reduced first cost, reduced maintenance or greater reliability of service.

Everywhere bus transportation officials know from actual records that Gruss Air Springs do reduce maintenance and insure reliability of service by absorbing the destructive road shocks and vibration.

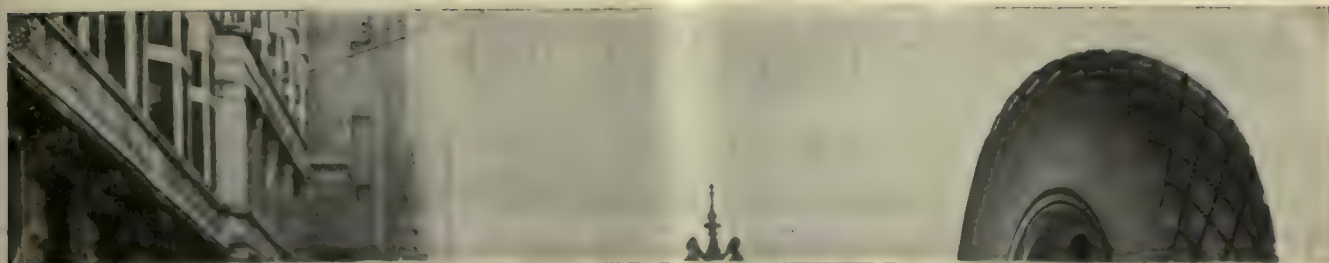
Gruss Air Springs are a definite step in the progress towards better, more profitable bus transportation. That is why leaders in this field are standardizing on Gruss equipment.

THE CLEVELAND PNEUMATIC TOOL CO.
 Cleveland, Ohio

GRUSS AIR SPRINGS

*for Trucks, Buses
 Passenger Cars ~*





What SUPERTWIST Adds to Goodyear Tires



One of the Goodyear-equipped fleet of Interstate Stages, Inc., operating daily between Detroit and Chicago

You know what rugged strength and long life have always been built into Goodyear Pneumatic Bus tires.

Now you may confidently expect even greater service from Goodyears in motorbus service, because Goodyear Pneumatic Bus Tires are now made with SUPERTWIST.

SUPERTWIST is the extra elastic, extra enduring new material specially developed by Goodyear for Goodyear balloon tires, motorbus and heavy duty cord tires.

It far outstretches ordinary cotton cord, and has a maximum flexing power that yields under impact, protecting the tire from rupture, stone bruise and other in-

juries. It thus insures virtually double the carcass life of the tire.

Other exclusive features of the Goodyear Pneumatic Tire construction for motorbus service are (1) the new Goodyear band-building method; (2) the new Goodyear breaker; (3) the new Goodyear bead—patent applied for, and (4) the famous All-Weather Tread.

These advantages you get only in Goodyear Pneumatic Bus Tires—the only motorbus tires made of SUPERTWIST.

They are real advantages, because they result in the utmost durability, tractive power, road safety, riding comfort and long, trouble-free mileage at low cost.

Goodyear Means Good Wear

GOODYEAR

Copyright 1926, by The Goodyear Tire & Rubber Co., Inc.

Annual Statistical Number

January 1, 1927

Facts—

Evidence of the accomplishments of the industry are to the electric railway operator what soundings are to the navigator.

KNOWLEDGE, of what has happened and is to happen through the interpretation of authentic figures, forms the basis of his future plan of operation.

Every year the electric railway operator has turned to the Annual Statistical and Forecast Number (dated January 1, 1927) of *Electric Railway Journal* for the facts that should guide his operations. This important issue will include:

Forecast of the Industry's expenditures
Trends in costs and fares
Total buses purchased by the Industry
Miles of track constructed, re-constructed and extended
Number of cars purchased
Number of receiverships lifted
Reviews of basic tendencies in legal, financial and regulatory matters
Plus a host of other pertinent facts

LOOKED TO and consulted as an authority, to aid in constructive planning the issue is an essential part of the operation of the property.

Because the issue is published at a time when the year's requirements are under discussion, the advertising pages form an important part of the Annual Statistical Number's function.

Today when the greatest buying movement in recent years is in immediate prospect, when railway men are welcoming the help that manufacturers can give in furnishing equipment and parts in tune with the new spirit of management and operation; when inventive and engineering skill are being called on for their best efforts; your message should be directed to this most active market through the Annual Statistical Number.

Write or wire your reservation now. Last forms close December 20. Our copy service department will gladly assist in the preparation of suitable copy.

Electric Railway Journal

Tenth Avenue at 36th Street, New York, N. Y.



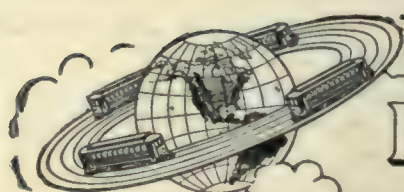
Etching made for the Kelly-Springfield Tire Company, by O. Kuhler, Pittsburgh



ALL over America today a network of motor coach lines is bringing town closer to town and making travel more convenient and more pleasurable. What has given such an impetus to this new phase of transportation? As much as any other one thing, the development of pneumatic tires that will stand up under weight, speed and strain. It is gratifying to us to know, from the testimony of hundreds of coach operators, that Kelly Heavy-Duty Cord tires have been a contribution of real value to this great new industry.

KELLY-SPRINGFIELD TIRES

The creation and maintenance of car advertising space values requires the same degree of highly specialized knowledge as the construction and maintenance of railroads. Such tasks should be delegated only to those of widest experience and longest record of success.



Barron G. Collier

INCORPORATED
CANDLER BLDG. NEW YORK



As you turn these pages

You are not prompted by idle curiosity, nor are you seeking entertainment for a few unoccupied moments.

Unknowingly, you exemplify our story. You are seeking and gaining information concerning your industry—quite logically—in the Business Paper which has been created to serve it.

An A. B. P. paper, such as this one, brings you unbiased up-to-the-minute news concerning the trend of industrial activities. It supplies you with organized knowledge and tested ideas, scientifically gathered and sifted by leaders in your phase of business.

Its knowledge is nation-wide and pertinent. The quality of its information—both editorial and editorial—is governed by its pledge to consider first and foremost your interests and to maintain the high standards of practice in all phases of its activities.

Through habitual reading, you will reap full benefit from this, your business paper.

THE ASSOCIATED BUSINESS PAPERS, Inc.

Executive Offices: 220 West 42nd St., New York, N. Y.

A. B. P.

An association of none but qualified publications reaching the principal fields of trade and industry.

The Electric Railway Journal is a member of The A. B. P.

FOR SAFETY FROM FIRE INSTALL THE

IMPROVED
Pyrene
TRADE MARK
FIRE
EXTINGUISHER

Safety demands that every car or bus be equipped with a *Pyrene* Fire Extinguisher. The riding public expect and are entitled to the protection from fire which this extinguisher assures.

Aside from the protection from fire afforded by such installation, to both rolling stock, operator and passengers, the schedule of the Central Traction and Lighting Bureau specifies a charge of 5¢ on motor buses, 3¢ on interurban and 1¢ on urban cars, for the absence of fire extinguishers.



The slight outlay involved by having rolling stock equipped with an Improved *Pyrene* (one-quart) Fire Extinguisher should be regarded as an investment—a device that helps make safety from fire certain should be popular.

Safety adds to the revenue of the operating company by inspiring confidence in the riding public toward modern transportation.

Many of the leading Public Service Corporations recognize this and have equipped their cars and buses with *Pyrene* Fire Extinguishers—they know a burning car or bus need not be abandoned if a *Pyrene* Fire Extinguisher is at hand.

For the protection of electrical equipment, power houses, car barns, shops and storerooms *Pyrene* (1½ quart) Fire Extinguishers are dependable in every emergency.

PYRENE MANUFACTURING CO.
NEWARK, N. J.

"Fortify for Fire Fighting"

Whatever your requirements

specify

Le Carbone Carbon
Brushes

They talk for themselves

W. J. Jeandron

Hoboken Factory Terminal,
Building F, Fifteenth Street, Hoboken, N. J.

Pittsburgh Office: 634 Wabash Bldg.

Chicago Office: 1657 Monadnock Block

San Francisco Office: 525 Market Street

Canadian Distributors: Lyman Tube & Supply Co., Ltd.
Montreal and Toronto

A Complete Line of Compressed Air Machinery for the Railroad

PNEUMATIC TOOLS

Pneumatic Drills
Riveting Hammers
Pneumatic Grinders
Air Motor Hoists
Sand Rammers
Tie Tamperers
Ball Drills
Utility Hoists
Clay and Trench Diggers
Paving Breakers
Rock Drills

AIR COMPRESSORS

Any Capacity
Any Pressure
Any Drive
Stationary
Portable
Tie Tamper

Other Products

PUMPS

Cameron Sinks
Cameron Drainage
Cameron Boiler Feeders
Cameron General Service
Dry Vacuum
Air Lift

CONDENSERS

Surface
Barometric
Multi-Jet

OIL ENGINE-ELECTRIC LOCOMOTIVES

OIL ENGINES



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Denver, Colo.
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El Paso, Tex.
Hartford, Conn.
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Joplin, Mo.
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Philadelphia, Pa.
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Pottsville, Pa.
San Francisco, Calif.
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St. Louis, Mo.
St. Paul, Minn.
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See other issues of
this periodical for
our display advertisement.

Request complete
literature.

INGERSOLL-RAND COMPANY—11 BROADWAY NEW YORK CITY

Offices in principal cities the world over

FOR CANADA REFER CANADIAN INGERSOLL RAND CO. LIMITED 260 ST. JAMES STREET MONTREAL QUEBEC

Ingersoll-Rand



Easton turntable at the
Commimpaw Terminal.
B. & O. R. R.

EASTON TURNTABLES

The same economic advantages which led the engineers of the Baltimore & Ohio railroad to install an Easton Turntable at its Commimpaw Terminal, have resulted in the installation of many others throughout the country.

Note the ease with which one man turns the table! A slight pressure of the fingers is sufficient!

Let Easton engineers show you how to save space in your crowded garage—in your car houses and shops—in your terminals—how to save labor in servicing operations and in speeding traffic. A letter of inquiry will receive immediate attention.

Do you need— Additional Space in Garage or Shop?

You can get it without construction of additions to present buildings! Let Easton engineers show you how!

With Easton Turntables installed in your shop and garage you will get the maximum use of floor space! Their installation means economic advantage in many places—in saving valuable floor space—in saving time and labor—in expediting servicing and shop facilities—as a combined turntable and bus washing platform—and many others. Their installation cost is low and maintenance practically nil—at most, a few cents for lubrication.

**EASTON CAR &
CONSTRUCTION CO.**

Easton, Pa.

Offices in:

New York
Pittsburgh

Kansas City
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Philadelphia
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"HOFFMANN"

The load-ability, the shock-ability, the speed-ability, the trouble-proofness, so essential to efficient traction motor service, are all combined in "Hoffmann" Precision Roller Bearings to a degree which makes their use a substantial operating economy.

Write us for Bulletin 904.

**NORMA-HOFFMANN
BEARINGS CORPORATION**

Stamford — Connecticut

PRECISION BALL, ROLLER AND THRUST BEARINGS



AMERICAN BRIDGE COMPANY

EMPIRE BUILDING—71 BROADWAY NEW YORK, N. Y.

Manufacturers of Steel Structures of all classes
particularly **BRIDGES AND BUILDINGS**

ALSO STEEL BARGES FOR HARBORS AND RIVERS, STEEL TOWERS
FOR ELECTRIC TRANSMISSION, HEROULT ELECTRIC FURNACES, ETC.

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Philadelphia, Pa.
Boston, Mass.
Baltimore, Md.

PITTSBURGH, PA.
Cincinnati, Ohio
Cleveland, Ohio
Detroit, Mich.

CHICAGO, ILL.
St. Louis, Mo.
Denver, Colo.
Salt Lake City, Utah

Pacific Coast Representative:
U. S. Steel Products Co.,
Pacific Coast Dept.

San Francisco, Cal.
Los Angeles, Cal.
Portland, Ore.
Seattle, Wash.

Export Representative: United States Steel Products Co., 30 Church Street, New York.



**AN IRON THAT RESISTS
RUST-ACID-CORROSION**

So much so, in fact, that it is used for
nitric acid containers, turbine buckets,
blades, coal mine equipment, marine
hardware, and sporting goods.

**DELHI TOUGH
IRON**

is worthy of your investigation.
May we send you the facts?



WM. WHARTON JR. & CO.
TISCO MANGANESE STEEL
TRACKWORK

Wharton trackwork, in which the
famous Tisco Manganese Steel has
been used, will be found on the lead-
ing railways of the country.

Plant: Easton, Pa.

Lorain Special Trackwork Girder Rails

Electrically Welded Joints

THE LORAIN STEEL COMPANY

Johnstown, Pa.

Sales Offices:

Atlanta Chicago Cleveland New York
Philadelphia Pittsburgh Dallas
Pacific Coast Representative:
United States Steel Products Company
Los Angeles Portland San Francisco Seattle

Export Representative:
United States Steel Products Company, New York, N. Y.

Bethlehem Products for Electric Railways

Tee and Girder Rails; Machine Fitted Joints;
Splice Bars; Hard Center Frogs; Hard Center
Mates; Rolled Alloy Steel Crossings; Abbott and
Center Rib Base Plates; Rolled Steel Wheels and
Forged Axles; Tie Rods; Bolts; Tie Plates and
Pole Line Material.

Catalog Sent on Request

BETHLEHEM STEEL COMPANY, Bethlehem, Pa.

BETHLEHEM



Special Track Work of every
description

THE BUDA COMPANY
Harvey (Suburb Chicago) Illinois

'CARNEGIE'
for
**WHEELS
AXLES
RAILS
CROSS TIES**



Carnegie Steel Company
PITTSBURGH, PENNA.

ELECTRICAL INSULATION

MICANITE and EMPIRE
INSULATOR
REG. U.S. PAT. OFF.

Micanite Sheets for all Purposes
Micanite Commutator Segments
Micanite Commutator Rings
Micanite Tubes and Washers
Linotape, Seamless or Sewn Bias
(Yellow or Black Varnished Tapes)
Empire Oiled Cloths and Papers
(Yellow or Black)
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Send for catalog and helpful booklet on Commutator
Insulation and Assembly

MICA INSULATOR COMPANY

Largest manufacturers in the world of mica insulation.
Established 1893

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Trade Mark

Seat and Curtain Materials
There is no substitute for Pantasote

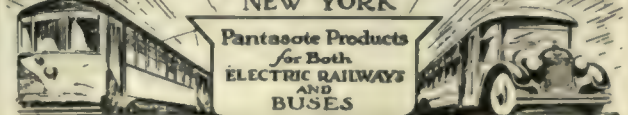
AGASOTE

Trade Mark

Roofing—Headlining—Wainscoting
The only homogeneous panel board

*standard
for electric railway cars
and motor buses*

The PANTASOTE COMPANY Inc.
At 46th, 250 Park Avenue Street
NEW YORK



The DIFFERENTIAL CAR



Standard on
60 Railways for

Track Maintenance
Track Construction
Ash Disposal
Coal Hauling
Concrete Materials
Waste Handling
Excavated Materials
Hauling Cross Ties
Snow Disposal

Use These Labor Savers

Differential Crane Car
Clark Concrete Breaker
Differential Bottom Dump Ballast Car
Differential Car Wheel Truck and Tractor

THE DIFFERENTIAL STEEL CAR CO., Findlay, O.

ELRECO TUBULAR POLES



COMBINE

Lowest Cost
Least Maintenance

Lightest Weight
Greatest Adaptability

Catalog complete with engineering data sent on request.

ELECTRIC RAILWAY EQUIPMENT CO.
CINCINNATI, OHIO

New York City, 30 Church Street



We make a specialty of
**ELECTRIC RAILWAY
LUBRICATION**

We solicit a test of TULC
on your equipment

The Universal Lubricating Co.

Cleveland, Ohio
Chicago Representatives: Jameson-Ross Company,
Straus Bldg.

BOYERIZED CAR PARTS



Brake Pins	Spring Post Bushings
Brake Hangers	Spring Posts
Brake Levers	Bolster and Transom
Pedestal Gibs	Chafing Plates
Brake Fulcrums	Manganese Brake Heads
Turnbuckles	Bushings
Center Bearings	Bronze Bearings
Slide Bearings	McArthur Turnbuckles
	Manganese Truck Parts

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Monmouth Bldg. San Francisco, Cal. W. F.
McKenney, 54 First Street, Portland, Ore.
L. H. Denton, 1328 Broadway, New York City.
N. Y. A. W. Arlin, 772 Pacific Electric
Bldg., Los Angeles, Cal.

Bemis Car Truck Company
Springfield, Mass.

Bankers and Engineers

Ford, Bacon & Davis Incorporated Engineers

115 Broadway, New York
PHILADELPHIA CHICAGO SAN FRANCISCO

The J. G. White Engineering Corporation

Engineers—Constructors

Oil Refineries and Pipe Lines, Steam and Water Power Plants, Transmission Systems, Hotels, Apartments, Office and Industrial Buildings, Railroads.

43 Exchange Place

New York

STONE & WEBSTER

Incorporated

EXAMINATIONS REPORTS APPRAISALS
ON
INDUSTRIAL AND PUBLIC SERVICE PROPERTIES

New York

Boston

Chicago

THE BEELER ORGANIZATION

ENGINEERS AND CONSULTANTS

Traction-Traffic-Equipment-Power Investigations

TRANSPORTATION, TRAFFIC, AND OPERATING SURVEYS

COORDINATING SERVICE—FINANCIAL REPORTS

APPRAISALS—MANAGEMENT

52 Vanderbilt Ave.

New York

SANDERSON & PORTER ENGINEERS

PUBLIC UTILITIES & INDUSTRIALS

Design Construction Management
Examinations Reports Valuations

CHICAGO

NEW YORK

SAN FRANCISCO

ENGELHARDT W. HOLST

Consulting Engineer

Appraisals Reports Rates Service Investigations
Studies on Financial and Physical Rehabilitation
Reorganization Operation Management

683 Atlantic Ave., BOSTON, MASS.

ALBERT S. RICHEY ELECTRIC RAILWAY ENGINEER WORCESTER, MASSACHUSETTS

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KELKER, DELEUW & CO.

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REPORTS ON

Operating Problems

Valuations

Traffic Surveys

111 W. Washington Street, Chicago, Ill.

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Engineering and Management, Construction,
Financial Reports, Traffic Surveys
and Equipment Maintenance

BALTIMORE
1904 Citizens National
Bank Bldg.

Phone:
Hanover: 2142

NEW YORK
49 Wall Street

DAY & ZIMMERMANN, INC. ENGINEERS

DESIGN - CONSTRUCTION - REPORTS
VALUATIONS - MANAGEMENT

NEW YORK

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CONSULTING ENGINEERS

Gardner F. Wells

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INVESTIGATIONS COVERING

Reorganization Management Operation Construction
43 Cedar Street, New York City

STEVENS & WOOD

INCORPORATED

ENGINEERS AND CONSTRUCTORS

120 BROADWAY, NEW YORK

ENGINEERING
CONSTRUCTION

YOUNGSTOWN, O.

FINANCING
MANAGEMENT

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Consultant on Fares and Motor Buses

The Weekly and Sunday Pass—Differential
Fares—Ride Selling

143 Crary Ave., Mt. Vernon, N. Y.

McCLELLAN & JUNKERSFELD

Incorporated

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Examinations—Reports—Valuations

Transportation Problems—Power Developments

68 Trinity Place, New York

Chicago

St. Louis

Transmission Line and Special Crossing Structures, Catenary Bridges

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ARCHBOLD-BRADY CO.

Engineers and Contractors

SYRACUSE, N. Y.

Byllesby Engineering & Management Corporation

231 S. La Salle Street, Chicago

New York

San Francisco

THE BABCOCK & WILCOX COMPANY

85 LIBERTY STREET, NEW YORK

Builders since 1868 of
Water Tube Boilers
of continuing reliability

BRANCH OFFICES

BOSTON, 49 Federal Street
PHILADELPHIA, Packard Building
PITTSBURGH, Farmers Deposit Bank Building
CLEVELAND, Guardian Building
CHICAGO, Marquette Building
CINCINNATI, Traction Building
ATLANTA, Candler Building
PHOENIX, ARIZ., Heard Building
DALLAS, TEX., 2001 Magnolia Building
HONOLULU, H. T., Castle & Cooke Building
PORTLAND, ORE., 805 Gasco Building



WORKS
Bayonne, N. J.
Barberton, Ohio

Makers of Steam Superheaters
since 1898 and of Chain Grate
Stokers since 1893

BRANCH OFFICES

DETROIT, Ford Building
NEW ORLEANS, 344 Camp Street
HOUSTON, TEXAS, 1011-13 Electric Building
DENVER, 444 Seventeenth Street
SALT LAKE CITY, 405-6 Kearns Building
SAN FRANCISCO, Sheldon Building
LOS ANGELES, 404-6 Central Building
SEATTLE, L. C. Smith Building
HAVANA, CUBA, Calle de Aguilar 104
SAN JUAN, Porto Rico, Royal Bank Building

F. J. BRENNAN

Traffic Analyst—Schedules

588 Park Place

Brooklyn, N. Y.

THE P. EDWARD WISH SERVICE

50 Church St.
NEW YORK

Street Railway Inspection
DETECTIVES

131 State St.
BOSTON

When writing the advertiser for information or
prices, a mention of the Electric Railway
Journal would be appreciated.

Our advertisement in the issue of December 4 showed how

HASKELITE and PLYMETL

cars are demonstrating their lightweight advantage in
Montreal.

Another ad will appear next week.

HASKELITE MANUFACTURING CORPORATION
133 W. Washington St., Chicago, Ill.

Hale and Kilburn SEATS

Better Quality Seats
For Cars and Buses

Hale-Kilburn Co.
1800 Lehigh Ave., Philadelphia, Pa.



STUCKI SIDE BEARINGS

A. STUCKI CO.
Oliver Bldg.
Pittsburgh, Pa.

RAIL GRINDERS AND WELDERS

Railway Track-work Co., Philadelphia

652



Adapted to all
Types of rails
and paving.

GODWIN Steel Paving Guards

Proven by service to economically prevent
seepage and disintegration of street railway
paving.

Write for Illustrated Catalog No. 20

W. S. GODWIN CO., Inc.
Race and McComas St., Baltimore, Md.

NACHOD & UNITED STATES SIGNAL CO. INC.

LOUISVILLE, KY.

BLOCK SIGNALS

FOR

ELECTRIC RAILWAYS
HIGHWAY CROSSING SIGNALS



Coin Counting and Sorting Machines

FARE BOXES

Lever-Operated and Slip Change Carriers

The Cleveland Fare Box Co.

Cleveland, Ohio

Canadian Cleveland Fare Box Co., Ltd., Preston, Ont.

UNA

RAIL BONDS-RAIL JOINTS
DYNAMOTORS
WELDING ROD

UNA Welding & Bonding Co.
Cleveland, Ohio

Keep your Eye on the
SEARCHLIGHT SECTION
and your advertisements in it



619



Eliminate rail joints
by

THERMIT-WELDING

METAL & THERMIT CORPORATION
120 Broadway, New York City, N. Y.

"The Standard for Rubber Insulation"

INSULATED WIRES and CABLES

"Okonite," "Manson," and Dundee "A" "B" Tapes

Send for Handbook

The Okonite Company

The Okonite-Callender Cable Company, Inc.

Factories, PASSAIC, N. J.

PATERSON, N. J.

Sales Offices: New York Chicago Pittsburgh St. Louis Atlanta
Birmingham San Francisco Los Angeles Seattle

Pettingell-Andrews Co., Boston, Mass.

F. D. Lawrence Electric Co., Cincinnati, O.

Novelty Electric Co., Phila., Pa.

Can. Rep.: Engineering Materials Limited, Montreal.

Cuba Rep.: Victor G. Mendoza Co., Havana.



*There is a
Specialty for
every
Distribution
requirement*



Hubbard and COMPANY

PITTSBURGH • OAKLAND, CAL. • CHICAGO

THE WORLD'S STANDARD

"IRVINGTON"

Black and Yellow
Varnished Silk, Varnished Cambric, Varnished Paper

Irr-O-Slott Insulation Flexible Varnished Tubing
Insulating Varnishes and Compounds

Irvington Varnish & Insulator Co.
Irvington, N. J.

Sales Representatives in the Principal Cities

Arc Weld Rail Bonds

AND ALL OTHER TYPES

Descriptive Catalogue Furnished

American Steel & Wire Company

Chicago
New York

Boston
Cleveland

Pittsburgh
Denver

U. S. Steel Products Co.

San Francisco

Los Angeles

Portland

Seattle

R. A. HEGEMAN, Jr., President H. A. HEGEMAN, First Vice-Pres. and Treas.
F. T. SARGENT, Secretary W. C. PETERS, Vice-Pres. Sales and Engineering

National Railway Appliance Co.

Grand Central Terminal, 452 Lexington Ave., Cor. 45th St., New York

BRANCH OFFICES

Munsey Bldg., Washington, D. C. 100 Boylston St., Boston, Mass.
Hegeman-Castle Corporation, Railway Exchange Building, Chicago, Ill.

RAILWAY SUPPLIES

Tool Steel Gears and Pinions
Anglo-American Varnish Co.,
Varnishes, Enamels, etc.

National Hand Holds

Genesco Paint Oils

Dunham Hopper Door Device

Garland Ventilators

Walter Tractor Snow Plows

Pt. Pitt Spring & Mfg. Co.,
Springs

Flaxlinum Insulation

Anderson Slack Adjusters

Economy Electric Devices Co.,
Power Saving and Inspection
Meters

Yellow Coach Mfg. Company—
Single and Double-deck Buses

Feasible Drop Brake Staffs

Kalamazoo Trolley Wheels

The value of Kalamazoo Trolley Wheels and Harps has been demonstrated by large and small electric railway systems for a period of thirty years. Being exclusive manufacturers, with no other lines to maintain, it is through the high quality of our product that we merit the large patronage we now enjoy. With the assurance that you pay no premium for quality we will appreciate your inquiries.



THE STAR BRASS WORKS
KALAMAZOO, MICH., U. S. A.

SPECIALISTS

in the

Design and Manufacture

of

*Standard—Insulated—and
Compromise Rail Joints*

The Rail Joint Company
165 Broadway, New York City

STANDARD

is the trade name for electric wires, cables and cable accessories whose superior quality has been demonstrated by 45 years of successful service.

If you are in the market for wires, cables or cable accessories get STANDARD prices before buying.

Standard Underground
Cable Co.

General Offices: Pittsburgh, Pa.
Branches in All Principal Cities.



SEARCHLIGHT SECTION

USED EQUIPMENT & NEW BUSINESS OPPORTUNITIES

UNDISPLAYED—RATE PER WORD.

Positions Wanted, 4 cents a word, minimum 75 cents an insertion, payable in advance.

Positions Vacant and all other classifications, 8 cents a word, minimum charge \$2.00.

Proposals, 40 cents a line an insertion.

INFORMATION:

Box Numbers in care of any of our offices count 10 words additional in undisplayed ads.

Discount of 10% if one payment is made in advance for four consecutive insertions of undisplayed ads (not including proposals).

DISPLAYED—RATE PER LINE

1 to 3 inches \$1.50 an inch

4 to 7 inches 4.10 an inch

8 to 11 inches 4.10 an inch

Rates for larger sizes, or yearly rates on request.

In advertising, inch is measured vertically on one column, 2 columns—30 inches—to a page.

When Writing Your Ad

Provide an indexing or subject word.

Write it as the first word of your ad.

If it is a Position Wanted or Position Vacant ad, make the first word the kind of position sought or offered.

This will assure proper classification in the column.

The right is reserved to reject, revise or properly classify all Want Advertisements.

Proper Classification

increases the possibility of Prompt Returns

POSITIONS WANTED

SUPERINTENDENT of transportation available, broad experience and fine record of achievements on large properties in East and Central West. Recognized as operating official of exceptional ability, successful in public relations, rehabilitation of properties, skilled in handling labor; capable taking over any property and getting results under any condition. High-class references. Correspondence invited and treated confidential. Willing to locate anywhere. PW-949, Electric Railway Journal, Guardian Bldg., Cleveland, Ohio.

SUPERINTENDENT, thoroughly reliable and capable, with excellent references, desires change. Not being forced out but looking for better opportunities. Widely experienced in both city and interurban operation, commendable past record for success in employee training and management, accident reduction, public relations, and the general solution of operating problems. PW-955, Electric Railway Journal, Tenth Ave. at 36th St., New York.

SALESMAN AVAILABLE

ELECTRICAL engineer: Graduate electrical engineer, experienced in design and manufacture of railway signaling apparatus, two years public utility work. Open for sales engineering position with electric railway supply house. SA-951, Electric Railway Journal, 1600 Arch Street, Philadelphia, Pa.

OFFICIAL PROPOSAL

Bids: Dec. 15.

Car Advertising Space

Honolulu, Hawaii.

Sealed proposals for the leasing of car advertising space in the street cars and buses operated by the Honolulu Rapid Transit Co., Ltd., of Honolulu, Hawaii, will be received at their office, 1133 Alapai Street, Honolulu, T.H., up to 13 o'clock noon, Wednesday, Dec. 15, 1926.

Specifications as to bids may be obtained from the office of the Company, the Electric Railway Journal or Electric Traction.

The company reserves the right to reject any or all bids.

Searchlight Results:

Equipment For Sale:

"Our advertisement in the Electric Railway Journal located a buyer, and I have disposed of the car in question."

President—Buffalo Industrial Plant.

"We have disposed of all of our Girder Rails advertised in your paper. We are frank to tell you that the material went to three different traction lines and represents three separate and distinct new accounts. Our idea is that when it comes to bringing something to buyers in the traction field, there is but one sheet, and that is yours."

Dealer—New York City.

"There is no necessity for the continuation of this advertising, for the reason that we could have sold this equipment five times over from the advertisement that was run one time."

Superintendent—A Pennsylvania Railway Co.

Equipment Wanted:

"The two insertions of this advertisement which you displayed in admirable manner were sufficient to obtain for us the exact equipment that we desired."

Superintendent—A New England Railway Co.

Positions Vacant:

"The strongest proof that your Searchlight Department finds its way to many readers is shown by the numerous letters we have received in answer to our recent advertisement."

Secretary—A Connecticut Railway Co.

"You gave us one good man as a result of a similar advertisement in the Electric Railway Journal some time ago. Please give us another."

Proprietor of Steel Sales Agency.

Positions Wanted:

"The result of advertising in the Searchlight Section of your Electric Railway Journal I have secured a position with The ——— Traction Co. of W. Va."

"I received 8 replies and accepted a position with the ——— Railway Co. with over 30% increase in salary."

Business Opportunity:

"Advertisement for investment to develop or acquire Traction Light & Power. The results from the advertisement in Electric Railway Journal have been satisfactory."

New York City Attorney.

SWEEPERS

2 Brill single truck sweepers. Fully equipped for double end operation.

IRVING S. VAN LOAN CORPORATION
1750 Broadway, New York City

Specialists in street cars or any part of a street car.

Illustrated bulletin supplied on request.

FOR SALE OR EXCHANGE

24 G.E. 210 box frame Motors, 70 hp.
12 G.E. 203 box frame Motors, 50 hp.

These types of Motors seldom appear in the second hand market.

ELECTRIC TRACTION & BUS CO.,
Times Bldg., New York City

FOR SALE

1—Snow Sweeper

Built by McGuire
Fine condition. Low price.
Immediate Delivery

ELECTRIC EQUIPMENT CO.
Commonwealth Bldg., Phila., Pa.

Buying Good Used Equipment

is frequently the difference between having good needed equipment or doing without it.

WHAT AND WHERE TO BUY

Equipment, Apparatus and Supplies Used by the Electric Railway Industry
with Names of Manufacturers and Distributors Advertising in this Issue

Advertising, Street Car
Collier, Inc., Barron G.

Air Brakes

Westinghouse Air Brake Co.
Air Receivers & Aftercoolers
Ingersoll-Rand Co.

Air Springs

Cleveland Pneumatic Tool
Co.

Anchors, Guy

Elec. Service Supplies Co.
Graybar Electric Co.
Ohio Brass Co.
Westinghouse E. & M. Co.

Armature Shop Tools

Columbia Machine Works
Elec. Service Supplies Co.

Automatic Return Switch

Stands
Ramapo Ajax Corp.

Automatic Safety Switch

Stands
Ramapo Ajax Corp.

Axles

Bemis Car Truck Co.
Bethlehem Steel Co.
Brill Co., The J. G.
Cincinnati Car Co.
Illinois Steel Co.
National Ry. Appliance Co.
Westinghouse E. & M. Co.

Axles, Steel

Carnegie Steel Co.
Ludlum Steel Co.

Badges and Buttons

Elec. Service Supplies Co.
International Register Co.

Barges, Steel

American Bridge Co.

Batteries, Dry

National Carbon Co.

Bearings, Ball

Norma-Hoffman Bearing Co.

Bearings and Bearing Metals

Bemis Car Truck Co.
Brill Co., The J. G.
General Electric Co.
Westinghouse E. & M. Co.

Bearings, Center and Roller

Side
Columbia Machine Works
Stucki Co., A.

Bearings, Roller

Norma-Hoffman Bearing Co.
Timken Roller Bearing Co.

Bells and Buzzers

Consolidated Car Heating
Co.

Bells and Gongs

Brill Co., The J. G.
Elec. Service Supplies Co.
Graybar Electric Co.

Benders, Rail

Railway Trackwork Co.

Bodies, Bus

Brill Co., The J. G.

Body Material, Haskellite and

Plymet
Haskellite Mfg. Corp.

Boilers

Babcock & Wilcox Co.

Bolts and Nuts, Track

Illinois Steel Co.

Bond Testers

American Steel & Wire Co.
Electric Service Supplies Co.

Bonding Apparatus

American Steel & Wire Co.
Elec. Service Supplies Co.
Graybar Electric Co.
Ohio Brass Co.
Railway Trackwork Co.
Una Welding & Bonding Co.

Bonds, Rail

Amer. Steel & Wire Co.
Elec. Service Supplies Co.
General Electric Co.
Graybar Electric Co.
Ohio Brass Co.
Railway Trackwork Co.
Una Welding & Bonding Co.
Westinghouse E. & M. Co.

Brackets and Cross Arms

(See also Poles, Ties,
Posts, etc.)

American Bridge Co.
Columbia Machine Works
Elec. Ry. Equipment Co.
Elec. Service Supplies Co.
Graybar Electric Co.
Hubbard & Co.
Ohio Brass Co.

Brake Adjusters

Brill Co., The J. G.
National Ry. Appliance Co.
Westinghouse Tr. Br. Co.

Brake Shoes

American Brake Shoe &
Foundry Co.
Bemis Car Truck Co.
Brill Co., The J. G.

Brakes, Brake Systems and

Brake Parts
Bemis Car Truck Co.
Brill Co., The J. G.
General Electric Co.
National Brake Co.
Westinghouse Tr. Br. Co.

Bridges, Steel

American Bridge Co.

Brushes, Carbon

General Electric Co.
Jeandron, W. J.
LeCarbone Co.
National Carbon Co.
Westinghouse E. & M. Co.

Brushes, Graphite

National Carbon Co.

Brushes, Metal Graphite

National Carbon Co.

Brushes, Wire, Pneumatic

Ingersoll-Rand Co.

Brushholders

Columbia Machine Works

Buildings, Steel

American Bridge Co.

Bulkheads

Haskellite Mfg. Corp.

Bunkers, Coal

American Bridge Co.

Bus Wheels, Steel

Heywood-Wakefield Co.

Buses

Brill Co., The J. G.

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and Manganese

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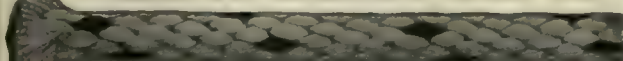
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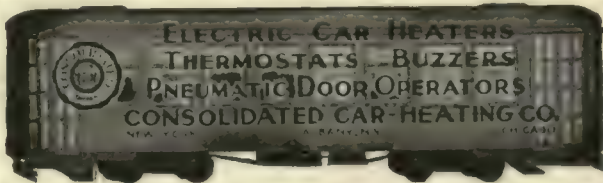
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Ramapo Ajax Corporation
RACOR
RAMAPO AUTOMATIC
RETURN SWITCH STANDS
FOR PASSING SIDINGS
TEE RAIL SPECIAL WORK
MANGANESE CONSTRUCTION
SALES OFFICES AT ALL WORKS
Main Office, HILLBURN, N.Y.



Double-end safety type built by the American Car Co. for Houston Electric Company

Efficiency achieved by light-weight modern cars in Houston, Texas

"Builders of
Financial Stability"

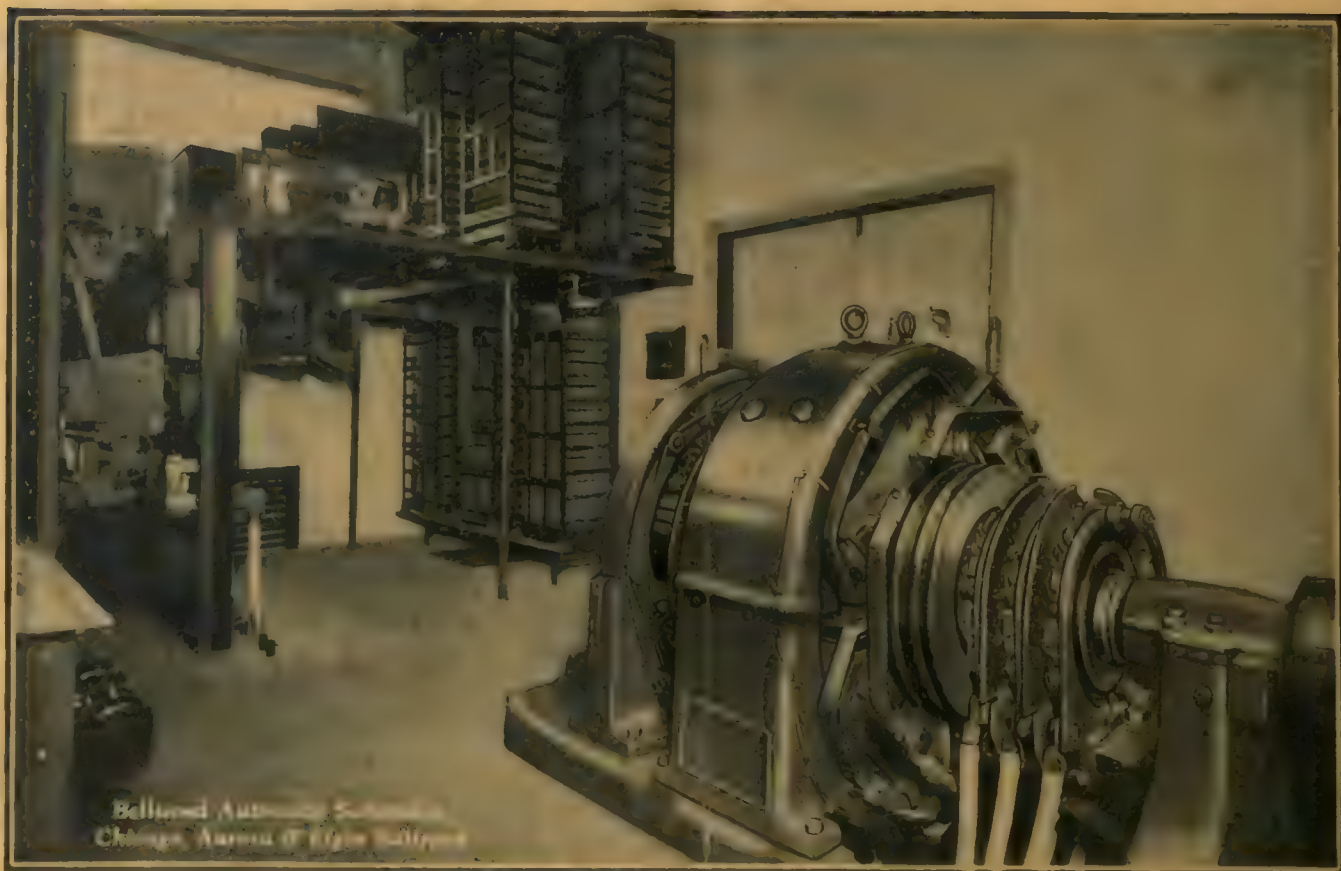
New **BRILL** Modern
Cars

That improvement in financial status results from displacement of heavy obsolete cars by new light-weight modern equipment is no longer debatable. There are so many outstanding examples of lower operating costs with new cars to convince the most skeptical.

When the Houston Electric Company introduced its present type of light-weight double-truck safety car it apparently adhered to a policy of accepting every opportunity for promoting maximum efficiency. The elimination of unnecessary weight, at the same time providing cars which are modern and capable of meeting their service requirements, has enabled the Houston Electric Company to reduce its operating cost 19.5 per cent. These figures tell their own story.

Actual Operating Costs Per Car Mile

	Old Cars	New Cars
Way and Structures.....	2.34c.	1.72c.
Maintenance of Equipment.....	3.07	2.09
Power	2.70	4.21
Conducting Transportation.....	11.82	9.15
Traffic .....	.04	.15
General and Misc.....	7.05	4.42
Total	27.02c.	21.74c.



Smoothing out the starting loads

Some idea of the severe overloads encountered by substations of the Chicago, Aurora & Elgin Railroad is obtained from the fact that frequently two 6-car trains are started at one time, each normally requiring 4000 amperes.



G-E Automatics, early adopted by the Chicago, Aurora & Elgin, have greatly facilitated operation of this road under heavy overloads. Their operating records show that 99.18% of several thousand starts are perfect; attention is one-fourteenth of that for manual stations.

By the use of automatic substations these trains can be accelerated properly and kept on time. Resistance is automatically connected to limit the converter current to a safe value. Thereby service is uninterrupted, even though the power required is greatly in excess of the converter capacity.

This load-limiting feature was one of the considerations upon which this company based its decision to use G-E Automatic Substations.

GENERAL ELECTRIC

GENERAL ELECTRIC COMPANY, SCHENECTADY, N. Y., SALES OFFICES IN ALL PRINCIPAL CITIES

ELECTRIC RAILWAY JOURNAL



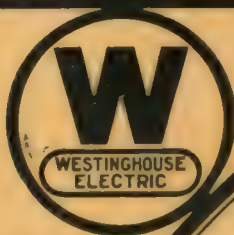
*I*T is our wish that the spirit of Good Will expressed in the symbol of Collier Service be not confined to the Christmas Holidays but that it be prevalent and active the year round.

Barron G. Collier, Inc.

Candler Building, New York



Maximum Contact *Always!*



Compensating Fingers

are self-aligning. Regardless of the contour of the controller drum surface, Westinghouse compensating fingers automatically adjust themselves to the position of maximum contact; they automatically provide an adequate contact area, within the capacity of the controller, to prevent heating or burning.

Study the illustration at the left; under the constant pressure of a long-lived coil spring the finger finds its own position. There can be no one-spot contact to heat or burn, even on badly worn controllers.

Ask the Westinghouse salesman for further information and prices.

Self-Aligning
Feature



Westinghouse Electric & Manufacturing Company
East Pittsburgh Pennsylvania

Sales Offices in all Principal Cities of
the United States and Foreign Countries



1926

Westinghouse

X88895

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Vol. 68
No. 25

CONTENTS

Pages
1077-1120

DECEMBER 18, 1926

Editorials	1077
Progressive Routing of Work Features	
New B.-M. T. Shop	1080
The electrical repair building is the first of the new Coney Island repair shops to be used by the rapid transit division of the Brooklyn-Manhattan Transit Corporation. Ultra-modern equipment installed for making repairs quickly and efficiently.	
Lehigh Valley Transit Modernizes Cars.....	1086
Interior of one city and one interurban car remodeled to increase comfort and attractiveness. New seats, improved lighting and pleasing decorative scheme adopted.	
Excessive Noise Eliminated by Rebuilding Track. .	1087
Worn frames were built up by welding. Pedestal jaws were strengthened and new type journal box with longer bearing was installed.	
Mica V-Rings and Bushings Have Important Functions in Commutators	1089
By JESSE M. ZIMMERMAN. The V-rings must be made of a bond which will not squeeze out under pressure, but which will soften when the commutator is heated so the ring will be plastic.	
Heavy Track Built in Los Angeles.....	1092
The Readers Forum	1093
Maintenance Notes	1094
New Equipment Available	1097
Association News and Discussion.....	1099
Snow Fighting in New England.....	1099
Symposium presented at the recent meeting of the New England Street Railway Club considers methods of keeping the lines open in bad weather so as to increase passenger riding.	
Experience in Snow Fighting on the Eastern Massachusetts	1100
By W. C. BOLT.	
Snow Removal in Hartford	1101
By N. J. SCOTT.	
Snow Fighting Equipment and Methods.....	1102
By E. L. LOCKMAN.	
American Association News	1103
Parking No Aid to Merchants	1104
By F. C. FOX. Congestion which the stores have helped to create is now interfering with business. Substitution of buses in place of street cars would only make matters worse.	
News of the Industry	1105
Recent Bus Developments	1111
Financial and Corporate	1113
Personal Mention	1117
Manufactures and the Markets	1119

Looking Forward

JANUARY 1 is the date of the Annual Statistical Issue of **ELECTRIC RAILWAY JOURNAL**. In that issue will be given a complete survey and review of the industry's progress during the year. Electric railway executives have come to look forward to this issue, and to rely upon it as a record of the year's developments.

Recent statistical numbers have also contained a forecast of the industry's budget for the ensuing year. This has been made possible through the co-operation of operating executives throughout the country. Ever since its publication was started, the forecast has checked within remarkably close limits with the actual record of expenditures compiled at the end of the year. This year the JOURNAL's forecast will be based on returns from an unusually large number of properties. For that reason it will give even more accurately than in former years a complete analysis of what the industry plans to do during 1927.

McGRAW-HILL PUBLISHING COMPANY, INC.

Tenth Avenue at 36th Street, New York, N. Y.

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Engineering News-Record

American Machinist

Power

Chemical and Metallurgical Engineering

Coal Age

Engineering and Mining Journal

Ingeniería Internacional

Bus Transportation

Electric Railway Journal

Electrical World

Industrial Engineer

Electrical Merchandising

Radio Retailing

Successful Methods

Journal of Electricity

(Published in San Francisco)

American Machinist—European Edition

(Published in London)



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Change of Address: When change of address is ordered the new and the old address must be given, notice to be forwarded at least ten days before the change takes place.
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 SAVING THE RAIL SAVES THE RAILWAY

Make the service right, then sell it

The first requisite in merchandising anything is a salable product. The only service you can sell is a service your public will buy. You can sell rides that are speedy, safe, silent and smooth.

You can provide such service only on well-maintained track.

Whatever you do to sell, whatever you do to provide fine cars—first provide well-maintained track:

Here are some of the widely used tools that make track maintenance a true economy.

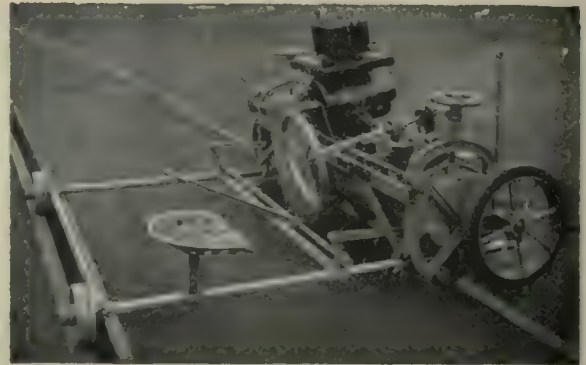
Railway Trackwork Co.

3132-48 East Thompson Street, Philadelphia

AGENTS:

Chester F. Gailor, 30 Church St., New York
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 H. F. McDermott, 208 S. La Salle St., Chicago
 Equipment & Engineering Co., London
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 Frazer & Co., Japan

1438



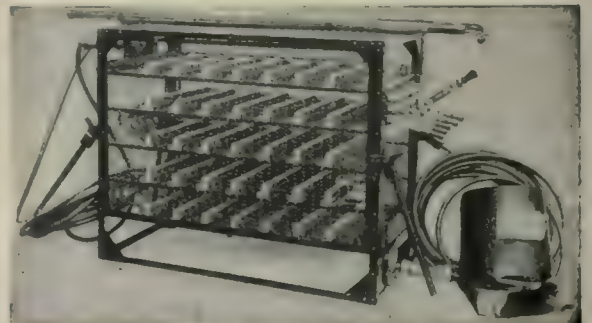
"Improved Atlas" Ball Grinder



"Imperial" Track Grinder

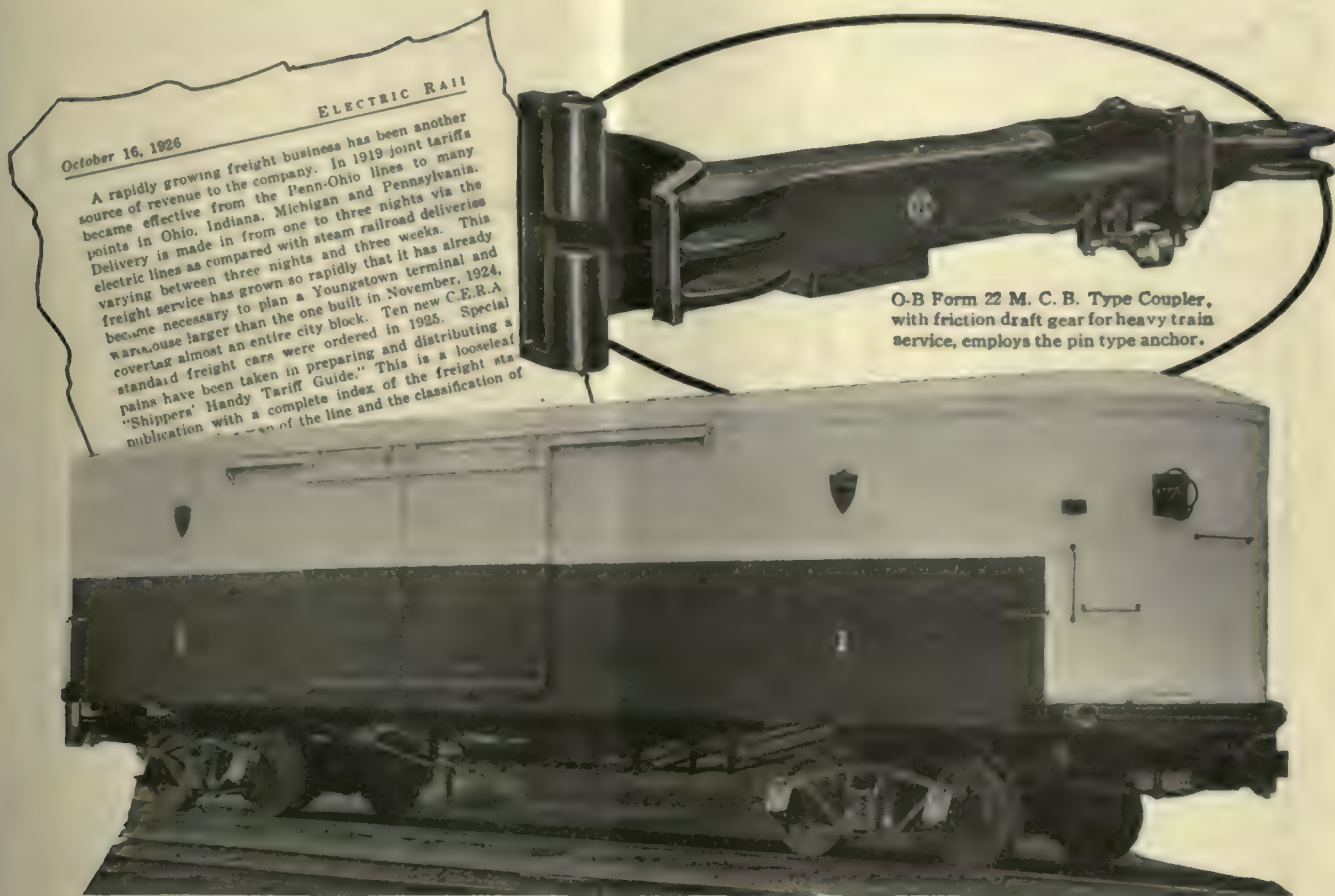


Reciprocating Track Grinder



"Ajax" Electric Arc Welder

 SAVING THE RAIL SAVES THE RAILWAY



O-B Form 22 M. C. B. Type Coupler, with friction draft gear for heavy train service, employs the pin type anchor.

Penn-Ohio Uses O-B Couplers for Interchange Service



O-B Coupler Equipment is widely used in the electric railway field, for both passenger and freight service. The new O-B General Catalog No. 20, gives full details. Have you a copy?

TEN new cars were recently put in service on the Pennsylvania-Ohio lines to provide for a constantly increasing freight traffic. These cars are constructed on the standard specifications of the C. E. R. A. They are designed for interchange service on all connecting electric railway lines in the Middle West.

Coupler equipment consists of O-B Form 22 MCB Type Couplers, especially designed for use in interchange service, where as many as 18 or 20 cars may be operated in a train. Under such conditions couplers must be exceptionally sturdy if cars are to be kept moving with little or no time off for maintenance. Thus, O-B Couplers are aids to delay-free service.

May we send you detailed information?

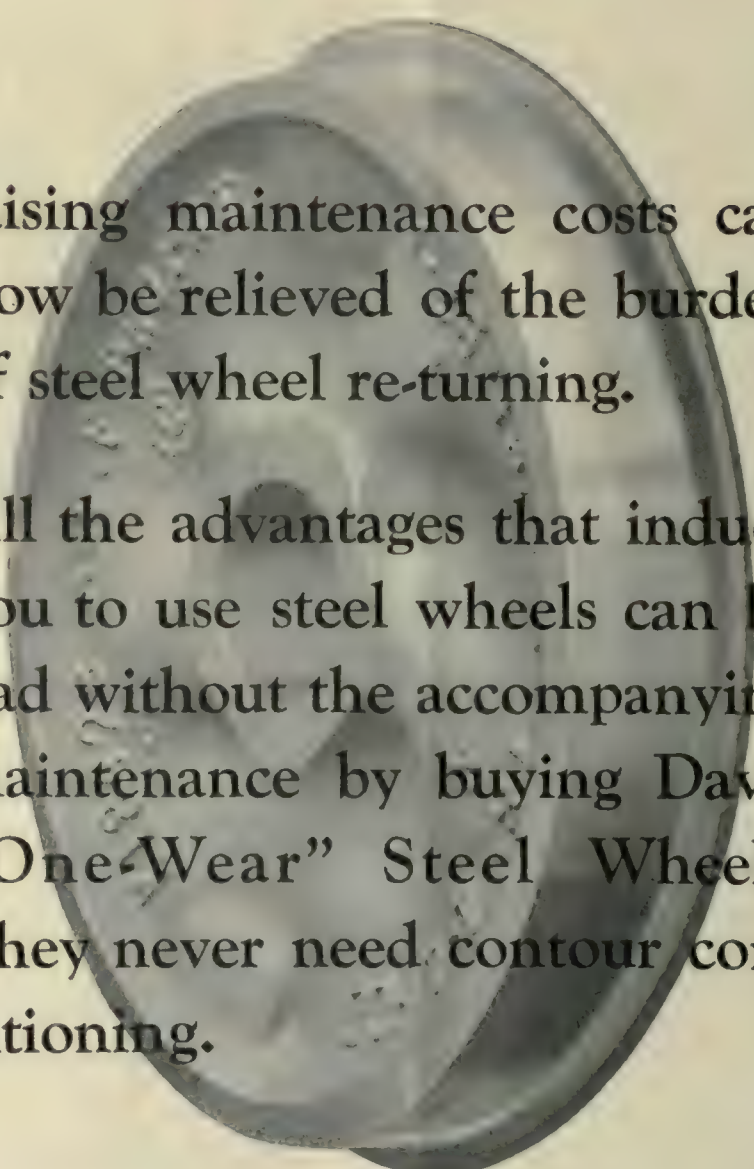
Ohio Brass Company, Mansfield, Ohio
Dominion Insulator & Mfg. Co., Limited
Niagara Falls, Canada
257C

Ohio Brass Co.



PORCELAIN
INSULATORS
LINE MATERIALS
RAIL BONDS
CAR EQUIPMENT
MINING
MATERIALS
VALVES

Relief from Swollen Maintenance



Rising maintenance costs can now be relieved of the burden of steel wheel re-turning.

All the advantages that induce you to use steel wheels can be had without the accompanying maintenance by buying Davis "One-Wear" Steel Wheels. They never need contour conditioning.

AMERICAN STEEL FOUNDRIES

NEW YORK

CHICAGO

ST. LOUIS

Relief from Paving Burdens

Three states and a number of municipalities have relieved electric railways from paving burdens, according to a recent Bulletin of the American Electric Railway Association. In most instances the relief granted was the cancellation of all paving and repaving requirements except the track foundation and damage to surface paving occasioned by operation of cars.

Companies thus relieved from surface paving can eliminate the question of tie and paving maintenance by installing *Steel Twin Tie Track*—a permanent foundation. Steel Twin Ties in concrete cost no more than most other track designs. Steel Twin Ties in concrete will outlast the rail. Steel Twin Ties and concrete require a minimum of maintenance during the life of the rail.

Write for detailed information on Steel Tie Track Construction, cost figures, and quotation today.

The International Steel Tie Company
Cleveland, Ohio



Steel Twin Tie Track



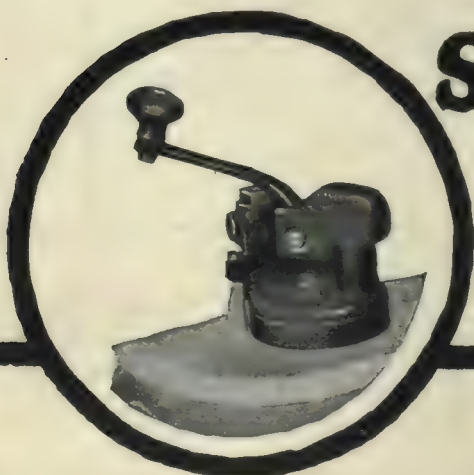
Safeguarding the fair and fare

Car riders and car revenue both need protection.

Efficient transportation service demands that traction companies make their cars safe and make them save. You can make your modern cars **SAFE** by interlocking the control, brakes, and doors. You can make them **SAVE** by thus centralizing operating responsibility in one man whose duties are properly safeguarded and simplified by complete protective and labor-saving devices.

We make the Safety Car
Control Equipment
which makes the Safety
Car.

Safety Car Control Equipment assures that the fair can go safer and the fare go farther.



SAFETY CAR DEVICES CO.
OF ST. LOUIS, MO.

Postal and Telegraphic Address:
WILMERDING, PA.

CHICAGO SAN FRANCISCO NEW YORK WASHINGTON PITTSBURGH



Safety Car Lighting Fixtures provide a steady, well-diffused light. Manufactured to the Keystone standard of quality, they are both ornamental and durable.



Hunter-Keystone Destination Signs are an effective way "To tell the Public where you're going." Designed to fit any available space.



Faraday Car Signal Systems fulfill the requirements for convenient, reliable passenger signal service.

Keystone Equipment

—on new interurban cars
for Stone Mountain sightseers

Elaborate ceremonies accompanied the dedication of 10 new cars for service between Marietta, and Stone Mountain, Ga. Many sightseers going to view the Stone Mountain Memorial will obtain the advantages of using these new interurbans of the Georgia Railway & Power Company.

Considered the last word in super-service—these cars are equipped with Keystone Equipment similar to those illustrated.

ELECTRIC SERVICE SUPPLIES Co.

PHILADELPHIA
17th and Cambria Sts.
PITTSBURGH
1123 Bessemer Building

NEW YORK
50 Church St.
BOSTON
88 Broad St.
LYMAN TUBE & SUPPLY CO., Ltd., Montreal, Toronto, Vancouver

CHICAGO
Illinois Merchants' Bank Bldg.
SCRANTON
310 N. Washington Ave.
DETROIT
General Motors Building



Can your cars "hold their own"?

City streets have become so crowded that there is constant competition between the various elements of traffic for the right of way.

If street cars are to meet this condition and hold their own in the general traffic movement they must be as mobile as other conveyances that use the streets.

An effective means of increasing car mobility is to provide brakes that will permit short stops, and the consequent longer period of peak speed operation and shorter running time between stops. With ordinary brakes, however, the retarding force which is satisfactory for the empty car is less effective when the car is loaded, so that the stopping distance lengthens, and this usually happens just when other vehicles are also contending for the right of way.

The Westinghouse Variable Load Brake was designed to correct this condition. It automatically adjusts the retarding force as the weight varies, so that the stopping distance is constant throughout the range of car loading. This results in accelerated transportation service just when the greatest possible hauling capacity is needed most.

Confer with our representative regarding the desirability of Westinghouse Variable Load Brakes for *your* new cars.

WESTINGHOUSE TRACTION BRAKE CO.

General Office and Works, WILMERDING, PA.

WESTINGHOUSE TRACTION BRAKES



In the Heart of London

That's where Threadneedle and Cornhill meet at the "Bank." Here, before the Royal Exchange, you see the Waukesha Motored Trackless Train which traversed the whole United States last year and just started on its European tour in June. Pulling a 16000 - pound Pullman trailer and hauling a total load of 24000 pounds on a rigid schedule all last year was a severe task. It is adequate proof of the Bus and Truck engine stamina built into all Waukesha "Ricardo Head" engines.

Waukesha four and six cylinder engines are built in sizes from 20 to 125 horse power. Send for the "Ricardo Head" Booklet explaining how more power, less gasoline consumption, and the elimination of "ping" are obtained.

AUTOMOTIVE EQUIPMENT DIVISION

WAUKESHA MOTOR COMPANY
Waukesha Wisconsin

Eastern Sales Office

Aeolian Building, 33 W. 42nd Street

New York City

Builders of Heavy Duty Engines for Over Twenty Years

The White Star Line's new fleet of 8 Studebaker
Parlor Car Busses—Knoxville, Tennessee.



700,000 Miles Proved Studebaker Dependability

So Tennessee Operator Buys 8 More Studebakers

FOUR years ago J. L. Kiser started the White Star Line with four Studebaker cars giving passenger service between Knoxville and Maryville. The continued profitable operation of Studebaker equipment on this route caused Mr. Kiser to standardize on Studebaker busses. His intimate knowledge of automotive value is founded on the experience gained as a motor car dealer prior to entering the bus field and he selected Studebakers because he found them best suited for the strenuous service imposed by the hilly roads in this section.

Mr. Kiser's latest purchase of 8 new Studebaker 20-Passenger Parlor Car De Luxe busses is further evidence of his satisfaction with these units.

In this territory the roads in many instances are rough and winding. Even the best highways reaching into the rugged mountains of eastern Kentucky and Tennessee test the stamina of bus equipment. Studebaker's outstanding success on these mountain roads over a period of years has caused other operators to standardize on Studebaker bus units.

Today more than 60 per cent of all bus equipment leaving the modern bus terminal at Knoxville is Studebaker. Lines running to points within a radius of 125 miles, served with Studebaker equipment, average 3,000 miles daily, giving prompt and dependable transportation.

Studebaker Features of Foremost Importance

Studebaker is the choice of an increasing number of operators because of the mechanical excellence of

the chassis, the practical design of the bodies and the unrivaled performance of these units in actual service.

According to the horsepower rating of the Society of Automotive Engineers, Studebaker is the most powerful bus chassis of its size and weight in the world. Extra factors of safety giving surplus strength include the 8-inch channel frame of $\frac{3}{16}$ -inch steel with two $3\frac{1}{2}$ -inch tubular cross-members in the center and a $2\frac{1}{2}$ -inch tubular cross-member at the rear in addition to the five regular cross-members. Wide use of special alloy steels gives staunchness of construction without excessive weight to increase operating costs.

- first cost
- operating cost
- maintenance cost
- depreciation cost

Lower

The large rear axle shaft; oversize propeller shaft; sturdy, resilient springs; special disc steel wheels and four-wheel hydraulic brakes all contribute to maximum dependability. Records of more than 250 operators whose Studebaker busses have covered more than 100,000 miles, many over 300,000, prove that the Studebaker bus chassis gives literally scores of thousands of miles of thoroughly dependable service at exceptionally

low operating cost and minimum depreciation.

Abundant Power

The engine is the famous Big Six Studebaker; velvet smooth in its operation even under a heavy load. Vibration is practically eliminated by the use of a fully machined crankshaft—an item of manufacturing which costs Studebaker over \$600,000 extra each year to insure accurately balanced motors.

STUDEBAKER



\$6150

f. o. b. Factory

The Studebaker 20-Passenger Parlor Car De Luxe Bus is the world's outstanding bus value—

FOR inter-city and suburban service, the Studebaker Parlor Car De Luxe Bus is an ideal unit for rapid, luxurious transportation. Mounted on the Studebaker bus chassis of 184-inch wheelbase, the body complete in its appointments offers a degree of luxury and comfort comparable only to busses selling for \$10,000 and up.

Entering at the 32-inch loading door, riders are impressed with the luxury of the interior. Silver gray mohair head and side lining—individual armchairs upholstered in genuine leather with wide spacing (30 inches) between the seats—a broad center aisle permitting easy access to any part of the bus—wide windows with double drapes—mirrors set into the window posts and six dome lights are some of the features that combine to create an atmosphere of comfort and refinement.

Excellent Ventilating and Heating Systems

Special attention is paid to proper ventilation and heating. Convenient ventilators over and at each side of the windshield admit a stream of fresh air while three roof ventilators insure a constant circulation of air currents. A special exhaust heater supplies sufficient warmth to maintain a comfortable temperature in cold weather.

These are important elements which contribute much to the comfort and health of the riding public.

Complete Equipment

There is nothing to buy but the license. No extra equipment of any kind is needed, for this bus is complete in every detail when it is delivered to the buyer. Standard equipment includes: stop signal system; illuminated destination sign at the front; concealed door control at driver's right; front and rear bumpers; automatic windshield cleaner and rear vision mirror; motometer with lock; extra wheel, tire, tube and carrier mounted on the left front fender; front and rear corner lights; inspection lamp; and rear traffic signal light. Two beam acorn headlights are controlled from the steering wheel. All instruments, including an 8-day clock and hydrostatic gasoline gauge, are grouped under a glass oval and indirectly lighted.

Most Economical to Operate

National investigation of operating costs covering six different bus chassis in a number of representative cities revealed the fact that it actually cost 7 to 9 cents *less* per mile to operate a Studebaker bus. This saving means big black figures on the profit side of the owner's ledger.

Lower first cost, plus its longer life, guarantees the lower depreciation cost of the Studebaker chassis. This saving together with lower operating expense assures the Studebaker operator of *more profits per passenger mile*.

Six Body Designs, 12 to 21 Passengers \$3935 to \$6150

Prices f. o. b. factory, covering body and chassis, complete. Purchase can be arranged on a liberal Budget Payment Plan—Small down payment and balance in convenient monthly installments.

12-Pass. (including driver) cross-seat Sedan-Type.....	\$3935
15-Pass. (including driver) cross-seat Sedan-Type.....	\$4295
19-Pass. (including driver) cross-seat Sedan-Type.....	\$5050
21-Pass. Pay-As-You-Enter Street-Car Type*.....	\$5125
18-Pass. (including driver) side-entrance Parlor Car.....	\$5300
20-Pass. (including driver) Parlor-Car De Luxe*.....	\$6150

*Includes dual rear wheels

THE STUDEBAKER CORPORATION OF AMERICA,
Dept. B South Bend, Ind.

Send me full information on Studebaker Busses without obligation

Name.....

Address.....

City..... State.....

We have..... busses at present.

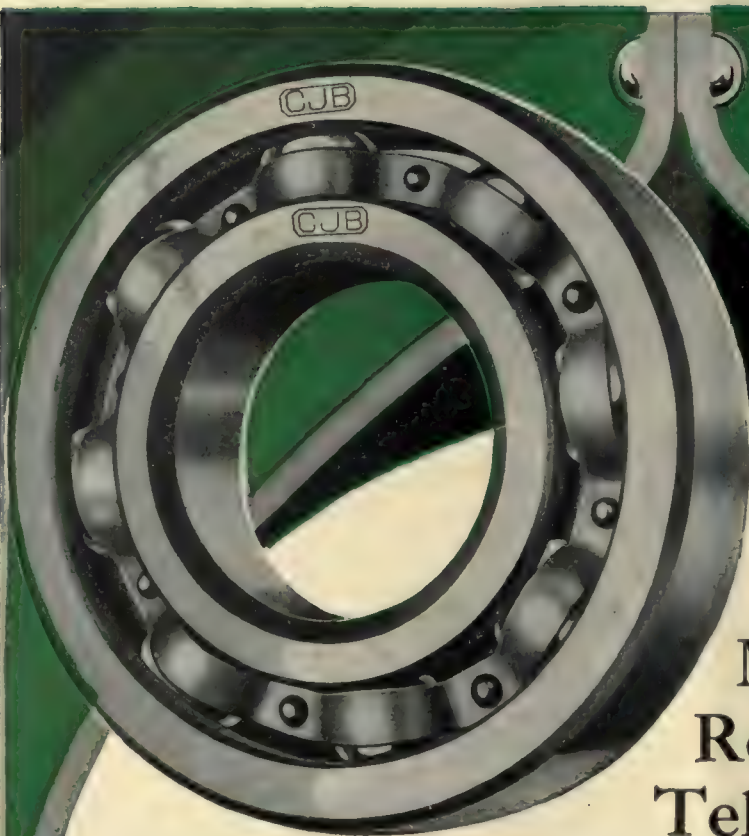
Check below the Studebaker Bus about which you desire information.

Type: Sedan..... Parlor Car..... Street-Car Type.....

Capacity:..... Passengers.

BUSSES

*more profit per
passenger mile*



Your Mileage Records Will Tell The Story

Ahlberg Ground Bearings

Have, by actual test, proved their superiority. You are sure of quality when you replace with Ahlberg Ground Bearings. There is an Ahlberg Branch near you with a complete stock. Save about one-third in first cost, and cut down maintenance.

The grueling service of transportation demands superlative quality in ball bearing equipment. Actual test of CJB Master Ball Bearings in service prove they possess such quality.

It is impossible for an imperfect bearing to get out of the Ahlberg plant. Our system of inspection covers the entire line of operations necessary in the manufacture of CJB Master Ball Bearings.

The Engineering Department of the Ahlberg Bearing Company is available at all times for consultation in connection with any problem having to do with ball bearings.

Your bearing needs will have our very best attention always.

Send for Our New Catalog.

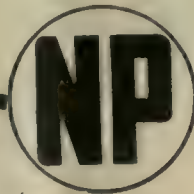
AHLBERG BEARING COMPANY
321 East Twenty-Ninth Street :: Chicago



MASTER BALL BEARINGS

The Holiday Rush

—is being handled in a half a hundred cities by the use of the Automatic Treadle Exit Door on one-man cars. Christmas crowds, in consequence, have found less crowding in the streets, at the doors, in the aisles, in paying fares and making change, faster movement of the cars and a freedom from congestion which is valued not only at the Christmas season but throughout the year.



IN THE FRONT AND
OUT THE REAR WITH

CIRCULATING LOAD



National Pneumatic Company

Executive Office, 50 Church Street, New York

General Works, Rahway, New Jersey

CHICAGO
518 McCormick Building

PHILADELPHIA
1010 Colonial Trust Building

MANUFACTURED IN
TORONTO, CANADA, BY

Railway & Power Engineering Corp., Ltd.

KENTUCKY TRACTION & TERMINAL

**This is what
these cars have
done**

Increased passenger
traffic 30%

Reduced operating
costs 37%
per car mile

Increased revenue
12.7%

Increased net income
from operation,
102.4%

Decreased demand on
power house, 350 KW

Decreased trains late
64.2%

Reduced total operating
expenses from 35.4
to 22.3 cents per car
mile.

**This is what
they think of
them**

*Some of the slogans used
to advertise the improved
service with **BALANCED**
Lightweight New Cars.*

**Rapid, Comfortable
Service**

**This Car a Community
Asset**

**Permanent 17-Hour
Service**

**America's Best-
equipped Railway
Saves Time**

**Our Pride, Your
Comfort**

**The Pullman of the
Streets**

**The Road of Originality
Exceptional Riding
Comfort.**



won the day *with Lightweight new cars* *of* **BALANCED DESIGN**

Increasing net income
from operation **102.4%**

High hopes have been built on the demonstrated possibilities of new lightweight cars. Yet few have dared think in such figures as these from the Kentucky Traction & Terminal Company.

Four and a half years ago this company put into service 14 NEW interurban cars, 27 NEW city cars, and several NEW lightweight freight cars,—all built by Cincinnati in accordance with the principle of BALANCED DESIGN.

Results followed immediately. Power consumption has dropped. Passenger traffic has increased. At the same time operating costs per car mile have been reduced. And the net result has been a 102.4% increase in net income from operation.

Of course, such outstanding success, has not been attained without progressive merchandising of the new service every step of the way.

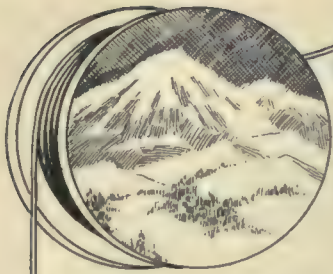
But successful merchandising depends essentially on the salability of the merchandise itself. And New Lightweight cars, of BALANCED DESIGN have proved beyond question their salability to a modern public,—with a liberal margin of profit.

We will gladly send you blueprints of recent Cincinnati Balanced Lightweight NEW cars, which can be adapted to meet conditions on your property with little or no expensive re-designing.

THE CINCINNATI CAR COMPANY
CINCINNATI, OHIO

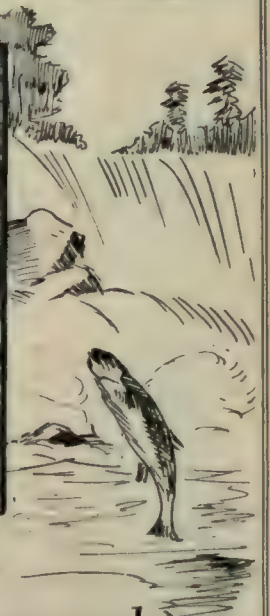
CINCINNATI *New* CARS

A step ahead of the modern trend



Round the Country with

Phono-Electric



BANGOR—Gateway to Maine's Playground

finds Phono little worn after **THREE YEARS** Service at busy intersections

Our photograph taken at Pol's Corner tells its own story. Street cars of the Bangor Hydro-Electric Company pass through this 6-line intersection every two minutes or less. The Phono-Electric overhead at this point is estimated to have withstood more than 375,000 passes without appreciable wear.

And similarly in other parts of the city,—at East Side Corner, at Post Office Square, at the Brewer Junction curve, and many other busy spots, Phono-Electric has come through

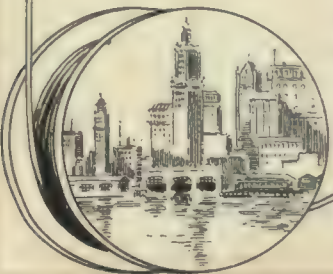
with flying colors. Indeed, the original installation, made three years ago, is still in excellent condition.

So it comes about that Bangor not only "very highly recommends" Phono-Electric, but plans to use it in replacing a large part of the present trolley wire as this becomes unfit for use.

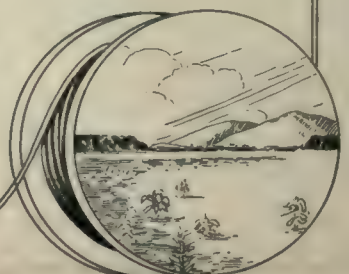
Have you read the convincing book of Phono Facts? It gives the why and wherefore of such success. A copy will be mailed promptly on request.

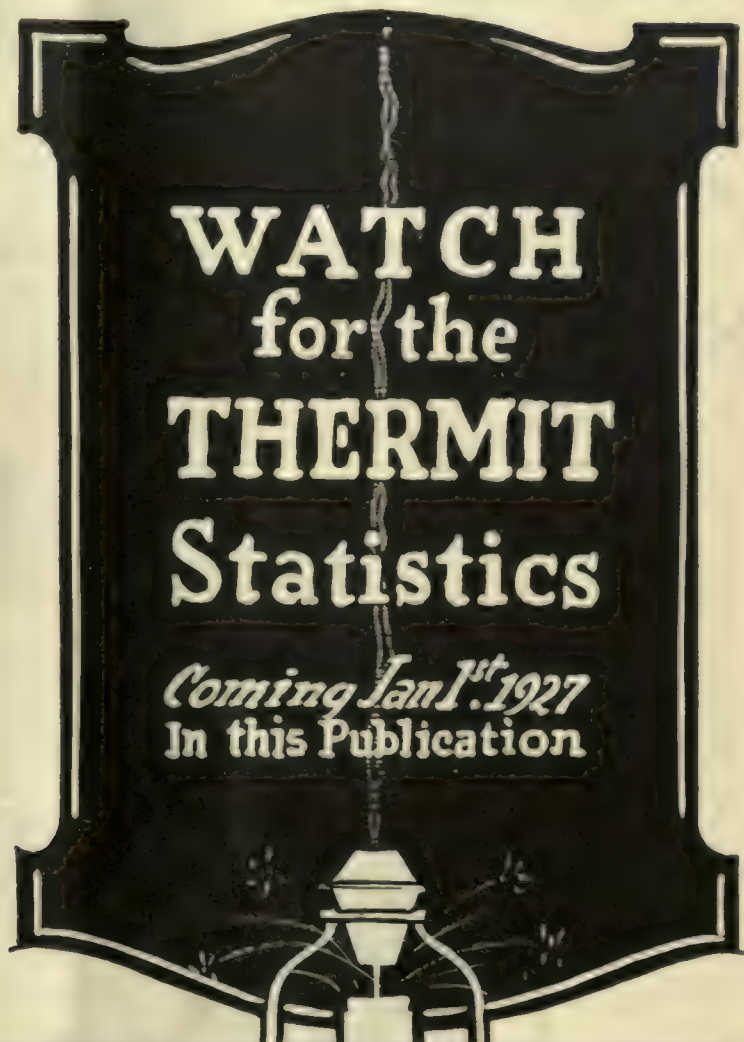
"Bridgeport"
TRADE CO. MARK
Phono-Electric

Bridgeport
Brass Company
BRIDGEPORT - CONNECTICUT



Trolley Wire





"Budgets of 1927"

Now is the time to plan the reconstruction program for the coming year. Is it going to be another temporary patchwork job?

Figure on a Thermit job, because a Thermit job is permanent.

"The first cost is the last cost."

Use the convincing statistics which will appear in our New Year advertisement to sell the idea to your Board of Directors. Where technical arguments may fail, the plan can be put over by this graphical picture we shall show of the general acceptance of Thermit throughout the electric railway industry.



METAL & THERMIT CORPORATION
120 BROADWAY, NEW YORK, N.Y.

PITTSBURGH

CHICAGO

BOSTON

SOUTH SAN FRANCISCO

TORONTO

American BROWN BOVERI

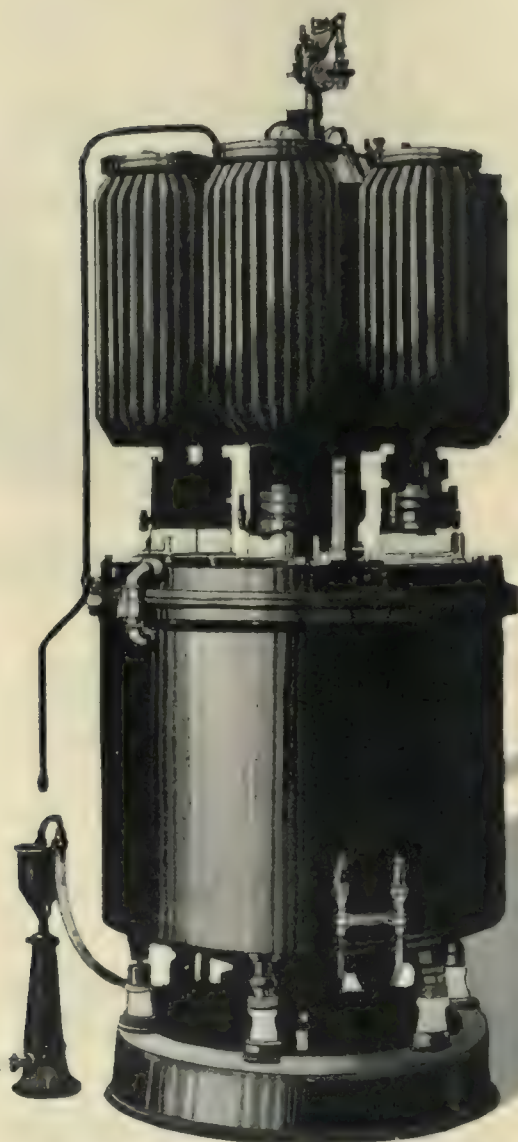
Summing-up!



has presented its case for Mercury-Arc Power Rectifiers. In the preceding advertisements of this series, their eight chief advantages have been clearly presented. They are briefly summed up here.

The verdict—"They are accepted practice!"

Numerous installations performing most satisfactorily uphold this verdict! Our engineers will be glad to cooperate in arranging for inspection trips or make recommendations covering your special requirements.



Descriptive Circular No. 301 describes ABB Mercury-Arc Power Rectifiers.

Principal Products

Mercury-Arc Power Rectifiers
(steel enclosed)

Electric Locomotives—for any
system of current, high or
low tensions

Complete equipment for rail-
way electrification

Rotary Converters
Motor Generators

Diesel-Electric Locomotives
Mining Locomotives

Switches, Controllers and all
Auxiliary Equipment
Automatic Regulators

Steam Turbo Generators for
normal or high pressures
and superheats

Oil Switches

Condensers and Auxiliaries

Relays

Turbo Compressors and Blowers

Electric Furnaces
Induction Regulators
Ships

Diesel Driven

Turbine Driven

Electrical Driven

Structural Steel Fabrication



Mercury-Arc Power Rectifiers

	<p>1. Efficiency</p> <p>From fractional output to maximum overload, the efficiency curve is higher than that of rotary equipment.</p>
	<p>2. Simple Operation</p> <p>Operation is characterized by extreme simplicity and a minimum of attention.</p>
	<p>3. No Synchronizing</p> <p>There is nothing to synchronize in starting up or throwing on line.</p>
	<p>4. Very High Momentary Overload Capacity</p> <p>Capable of handling sharpest momentary peaks, and short circuits cannot harm it.</p>
	<p>5. Negligible Maintenance</p> <p>Simplicity and ruggedness of construction and absence of moving parts results in virtual elimination of maintenance.</p>
	<p>6. Low Weight</p> <p>Comparative lightness in weight eliminates necessity for heavy, special foundations.</p>
	<p>7. Noiseless Operation</p> <p>Quiet, vibrationless operation permits location of substations in centers of dense population.</p>
	<p>8. Light Construction for New Substations</p> <p>Mercury-Arc Rectifiers can be installed almost anywhere, because they are so light in weight, and free from moving or rotating parts.</p>

American Brown Boveri Electric Corporation

165 Broadway, New York, N. Y.

Camden, New Jersey

922 Witherspoon Bldg., Philadelphia.

842 Summer St., Boston.

230 South Clark Street, Chicago



AMERICAN BROWN BOVERI

A real Pinion Puller



that can do no damage

THIS pinion puller uses the old-time wedging principle but with this difference. It is so applied that it can do no damage to the shaft, bearings, housing, or to the pinion itself. The puller ring grips all the teeth of the pinion equally, and thus prevents localized stresses on a small number of teeth.

The wedges, wedge box, and jack screw are the same for all pullers; the puller rings and pressure caps vary with the diameter of the pinion for which the puller is required. Where pinions are only slightly different in diameter, a common ring may be used.

Let the Railway Specialist in your nearby G-E office give you further facts.



To maintain original equipment quality, good tools are as necessary as faultless repair parts. Here is an example of General Electric foresight in providing the best to prevent spoilage and to speed up repairs.



For

Original Equipment Quality

GENERAL ELECTRIC

Electric Railway Journal

Consolidation of Street Railway Journal and Electric Railway Review

Published by McGraw-Hill Publishing Company, Inc.

CHARLES GORDON, Editor

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New York, Saturday, December 18, 1926

Number 25

Devices for Rapid Machining Require Careful Checking

ACCURATE machining of wearing parts is being given more attention by electric railway shopmen than ever before. This is encouraging, as it shows that the revised standards of machining tolerances made by association committees, together with various recommendations for reducing noise by maintaining closer fits, are receiving consideration by the maintenance departments. One railway reports that its stepping for the bearing fits of armature shafts has been reduced one-half. Where previously $\frac{1}{32}$ -in. wear was permitted and then the shaft was turned down $\frac{1}{16}$ in. to the next standard undersized diameter, now but $\frac{1}{64}$ -in. wear is allowed and the shafts are reduced in diameter but $\frac{1}{32}$ in. to the next step. This practice not only keeps the fits much closer but results in considerable saving in the amount of metal that is turned off to reduce a shaft bearing to the next size.

On another railway property, in checking the accuracy to which armature bearings were being machined, a somewhat surprising fact was disclosed. The bearings were first finished on the outside and the boring was done with the bearing held in a self-centering chuck. It had been assumed that this insured accurate centering of the bore in relation to the outside fit. The checking disclosed bearings with the inside bore out of center from 0.005 to 0.01 in. A bearing that had just been finished in the chuck was marked so that it could be reinserted in the same position. It was then removed and immediately put back in the chuck. Upon starting the boring bar the tool began a cut of about 0.005 in. on one side of the bore.

Use of the self-centering chuck had reduced the time of machining bearings to about one-third that taken when bearings were held in the three-jaw chuck of the lathe. It permitted a slight misalignment, however, so that the bore was not centered accurately. With the old method the machinist did not depend on the holding device for accurate centering and so each bearing was tested carefully for alignment before the boring operation was started. Too great dependence had been placed on the new chuck and inaccurate machining resulted.

Railway Holds First Place in Automobile Manufacturing Center

MORE automobiles are manufactured in Detroit and its environs than in any other city in the world. The employees of this industry far outnumber those of any other industry in the district. On account of the freight differential, automobiles are somewhat cheaper there than elsewhere. Consequently, the automobile has reached the zenith of its popularity in Detroit. It is

the more remarkable, therefore, to find that public transportation vehicles are carrying more than 80 per cent of the city's traffic, as was indicated by a recent investigation made by the Retail Merchants' Association.

Street cars were found to be the most important means of transportation, being used by some 56 per cent of all customers at 27 downtown stores. Buses carried slightly more than 24 per cent, while only about 19 per cent came by private automobile. Details of this traffic count appeared in last week's issue. No marked differences from trends indicated by similar checks in other cities are to be seen in the Detroit figures, nevertheless it is interesting to note that the electric railway holds the place of first importance even in the heart of the automobile manufacturing district.

Pull-In Comparisons Not Always Reliable

DISCUSSION to no avail arises from data relative to pull-in records for the simple reason that a pull-in in one city is not so counted in another. Then, too, some companies eliminate from the record pull-ins due to service causes such as broken windows, minor damage because of collision, etc. Master mechanics on other properties that are doing a good job of maintenance may have their records subjected to an invidious comparison because of their companies' policy of counting all pull-ins, whatever the cause, as a basis for determining the pull-in records.

At the meeting of the Iowa operators in Omaha last month the question of car-miles per pull-in was often referred to, the values, however, varying from a few thousand to 20,000. Last summer at the Chattanooga meeting of the Southern Properties' equipment men records of car-miles per pull-in were reported and published in the JOURNAL varying from 5,000 up to 98,000. It seems reasonable to suppose that the methods of determining pull-ins must vary widely in order to obtain such different results.

Comparative records are always of value when made on the same basis. When such a basis does not exist such records are worse than useless. It is far from a simple matter to determine a standard basis for counting pull-ins. On some properties cars are turned in for the slightest failure, while on others repair men fix damaged parts on the road. This difference may even exist on various divisions of the same property. There is also considerable variation due to the character and condition of the equipment and the type of service in which it is used. Old cars manifestly will be expected to give more trouble than new ones. Four-motor cars would be expected to develop more defects than two-motor cars. Such differences as these are

**This is the issue in December that is devoted essentially to maintenance
and construction subjects**

likely to overshadow variations in operation by the individual motormen.

For determination of the total record there is some background of opinion for counting every pull-in without reference to cause. These pull-ins can be analyzed to determine those arising from traffic accidents, shop failures or inspection failures. Even on this basis there will be some difficulty in determining a standard, although if no attempt be made to use the figures as a means of discipline much valuable information may be obtained from them.

Robbing Peter to Pay Paul Is an Expensive Proposition

FEW will deny that a broad and intelligent program of improvement in shop practice must carry with it an equally comprehensive modernization of shop equipment. But, having agreed on this central thesis, any given number of individuals will at once split asunder upon the rock of accomplishment. Those there will be who favor encouraging the local inventive talent to be found within the ranks of their own shop forces—in other words, the home manufacture of machines and devices which are at all within the range of the shop equipment at hand.

Some almost uncanny fascination seems to invest this doctrine of self-sufficiency; it grows upon one. Soon the shop superintendent who started out to build a machine or two for some specific purpose will find himself exercising much ingenuity in devising equipment which at best will accomplish nothing more than any one of a number of machines already on the market. This is assuredly left-handed economy. By far the greater number of progressive mechanical men recognize it as such. Yet in an astonishing number of shops throughout the country one finds the "home-made prodigies" continuing to blossom out with distressing frequency.

Shop forces and shop equipment have certain inalienable duties to perform. Their existence is justified only on the score of their ability to keep the rolling stock in a condition as efficient as possible. Diverted into channels of competition with established equipment manufacturers, they are shooting far from the mark. True, there are isolated instances where a special type of machine has been needed to accomplish a certain function and where such a machine has not been available, nor have there been sufficient funds at hand to purchase it. Here the home-made device has played a valuable rôle. It should be obvious, but apparently is not, that local talent cannot hope to turn out equipment for standard purposes that will function as efficiently as machines which have been produced by manufacturers after large sums have been expended in research and development work.

It should be possible to determine quite accurately the economies which the introduction of new shop equipment will effect in any given service. Minute operating data have been compiled by the manufacturers and are available to railway executives. These, in comparison with records which are generally kept on existing machines, will give the desired information. On the other hand, it can scarcely be determined in advance whether a contemplated piece of home-made equipment will actually save money, or simply will serve to gratify the ego of its proud inventor.

\$10 for Improved Car Appearance

May Result in \$100 Increased Income

FROM the animated discussion given to the subject of improving car appearance at the recent meeting of the rolling stock committee of the American Electric Railway Engineering Association it is evident that increased attention is being given to car cleaning and painting methods. The general opinion expressed was that cars can be painted much more cheaply if the work is done at frequent intervals and that the added attractiveness of cars which results from frequent painting increases car riding to a marked extent.

As an example of what can be done through shortening painting intervals one superintendent of equipment stated that from 1923 to 1925 his company has increased the number of revenue cars painted annually from 33 per cent to 82 per cent of the total and at the same time the cost of painting has been reduced 75 per cent. Cars on this system are now painted every ten to twelve months. Of course not all of this decrease in painting cost is the result of more frequent painting. The painting system has been changed, the number of coats has been reduced, the spray is used wherever possible instead of the brush method, a simplified color scheme has been adopted and the schedule of painting operations has been standardized. However, the decreased time between paintings has made it possible to use more economical painting methods and still keep the cars in a more attractive condition.

Improved car cleaning methods help to keep the painted surface in good condition. Certainly there is no feature that will add more to the appearance of car interiors than cleanliness. Spray washing and high pressure washing are being used more extensively than ever before. By giving particular attention to car cleaning problems cars are cleaned now at much shorter intervals without increasing the total cleaning cost. Many railways clean their cars thoroughly every night, while there is a periodical cleaning once a month, at which time particular attention is given to upholstered seats and parts that are somewhat inaccessible.

It thus appears that a considerable increase in attractiveness of cars can be produced without an increase in maintenance costs. Certainly the added revenue that is sure to result will warrant expenditure of modest sums for more modern painting and cleaning equipment. Added attractiveness to cars will aid materially in winning back former patronage and the visual invitation of clean, well-painted cars will create an instinctive desire to ride.

What Are Our Future Equipment Executives Doing Today?

HOW may we gain recruits for our equipment forces—particularly from among the younger generation who later must provide the group from which the equipment executives of the future will be selected? This is indeed a problem which is facing not only electric and steam railroad companies, but many industrial organizations as well.

With the present general prosperity, all evidence goes to show greatly increased desire for higher education among the youth of the country, with consequent later inclination toward "white-collar" jobs, in spite of the fact that the average mechanic of today makes considerably more money than the average clerk. Social

conditions, therefore, are tending, probably more than in the past, to reduce the quota of young men, both of high school and of college education, who turn to mechanical pursuits as a life career.

Electric railways are intimately concerned with this fact, not only because of the constantly increasing need for better men and better minds to cope with the ever-increasing engineering problems in the electric railway industry, but because equipment work furnishes one of the very best training schools for the offices of president, vice-president and general manager on an electric railway system. This may seem strange to some, but the fact is, the equipment department has been the training school of many of the most successful operating railway executives—both steam and electric—of the present day. A man who has had this training has a knowledge of the fundamental mechanical principles of railway operation that he who has not been actively associated with the equipment department hardly, if ever, is able to acquire. This basic knowledge of the tools which a railway has to use in its daily service—cars, track and power—stands the mechanically trained executive in good stead when he has to pass on those questions of labor and finance which are concerned with daily car and train operation.

A Remedy for Congestion Is Known, but Courage Is Lacking to Apply It

CONGESTION of traffic exists today in the streets of many of our large cities because the municipal authorities do not dare take the steps necessary to afford relief. This was brought out clearly at the December meeting of the A.E.R.A. Metropolitan Section. General agreement that automobile parking is the chief cause of congestion was expressed by the deputy chief inspector in charge of the traffic division of the New York Police Department, by the vice-president of one of the principal street railways in the city and by an executive of a large department store. Notwithstanding this unanimity of opinion as to the cause of the trouble, there was no intimation that action would be taken to relieve the situation.

Many thoughtful retail merchants in New York and elsewhere are awaking to the possibility of decentralization. Because of the difficulty of reaching the downtown shopping district, business is steadily slipping away to the neighborhood stores. These downtown merchants realize that for every customer accommodated by liberal parking rules a dozen, or a score, or hundreds are inconvenienced. They see that the salvation of the big stores lies in the efficient operation of public transportation systems which are used by the large majority of their customers.

The surface transportation systems, which carry 40 per cent. of the total traffic in New York City, cannot function efficiently when anywhere from a quarter to a half of the available roadway space is devoted to parking. There is not sufficient room left for moving vehicles. Yet his Majesty the automobilist continues to be allowed to do as he pleases about obstructing the street.

From the remarks of the deputy chief inspector it appears that the evils of present conditions are well understood by the Police Department. But the police are powerless to do anything about it. "Unless help comes from some source, and comes quickly," the inspector said, "we will see traffic completely tied up in cer-

tain parts of this city." What a confession to come from the head of the traffic division of the largest city in the United States! The seriousness of the situation is recognized, the remedy is known, but the municipal authorities have not the courage to put it into effect.

Political Bungling

Jeopardizes Chicago's Transportation

EVENTS in the Chicago situation have been moving so rapidly in recent weeks that it is difficult to predict what the next development will be. One thing, however, stands out and characterizes the entire series of proceedings. No cleaner-cut example of political inefficiency can be found than in the present Chicago transit situation. Here is a group of companies comprising the largest surface lines system in the world. It has continued to rise in the very face of expiring franchises and maturing bonds, to the highest state of perfection in its history.

Despite the political situation, the service has been improved by the purchase of 445 new cars within the last four years. The companies under the operating agency of the Chicago Surface Lines have shown progressiveness in modernization programs that have relieved traffic congestion in the famous Chicago Loop, and otherwise have rendered a service generally proclaimed to be the best in the country. Both earnings and wages have been increased, and instead of allowing an atmosphere of discouragement and despair to prevail, the business has been conducted in an orderly manner and with that quiet efficiency that has met with the popular approval of the patrons served.

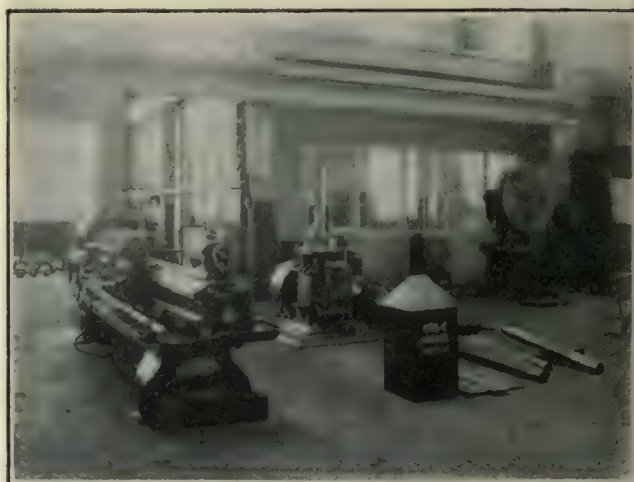
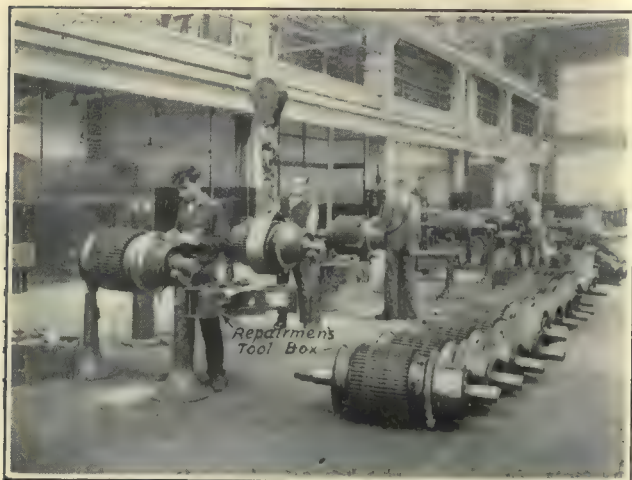
In fact, all of the elements necessary for adequate transportation are within easy reach. Only the handicap of expiring franchises hampers the economic growth of this great group of properties. Capital and management have done their best; but the evils of the short-term franchise, with the management harassed by self-seeking politicians, threaten the continuance of this valuable public service.

The city of Chicago has not shown a lack of interest in the situation. Many reports have been made, much testimony has been listened to, innumerable committees have been appointed. By referendum vote two proposed solutions of the difficulties have been defeated. The fact remains, however, that Chicago to-day is without a plan of settlement, and the franchises have but one month to run in the coming year. With their expiration the underlying bonds fall due with no basis on which to refinance. So also the agreement of joint management of the four underlying companies comes to an end.

It is useless to predict the future. The protection of the courts has been invoked. That is only a temporary expedient. Whether or not a plan can be worked out depends on co-operation by the city and a change in attitude, not yet in evidence. At best the management and capital that performed with such faith the service so necessary to Chicagoans will be jeopardized.

The real contribution that makes for success or failure is one of management. Any one can provide transportation, but only the trained management with adequate protected capital can provide the kind of transportation that will meet with success in present day life. Certainly justice and common sense alike demand the support of operators who have had a record of accomplishment like those in Chicago.

The Central Bay of the B.-M. T. Electrical Repair Shop and Four Departments in It



The four small pictures show close-ups in the corresponding corners of the bay, which is spanned by a 5-ton traveling crane and two traveling wall jib cranes. Upper

left—Armature core and commutator repair department. Upper right—Armature winding; outlets for gas, compressed air and testing current are provided. Lower

left—Horizontal and vertical hydraulic presses for forcing operations. Lower right—Modern axle lathe, vertical key seater and punch press, superintendent's office.

Progressive Routing of Work Features

New B.-M.T. Shop

FIRST ARTICLE

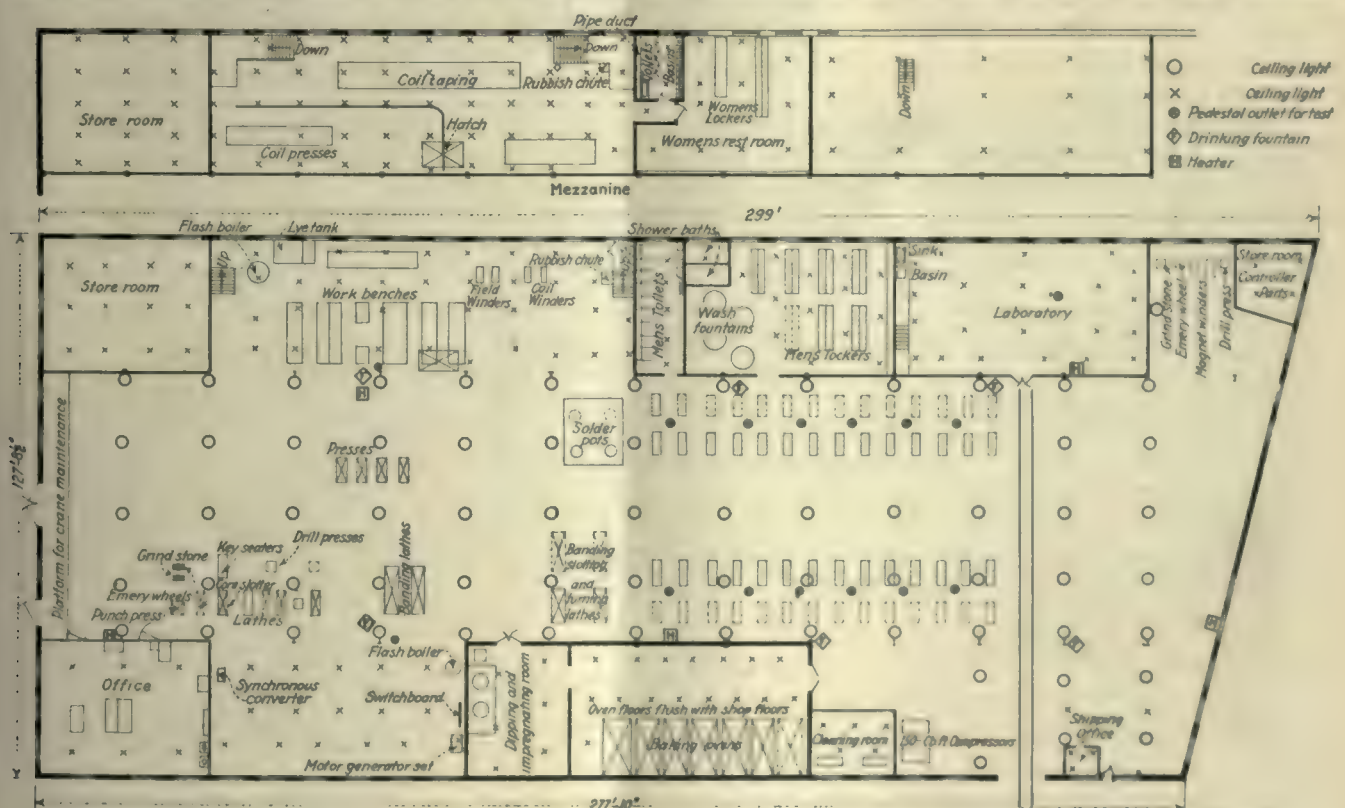
The Electrical Repair Building Is the First of the New Coney Island Repair Shops to Be Used by the Rapid Transit Division of the Brooklyn-Manhattan Transit Corporation — Ultra-Modern Equipment Installed for Making Repairs Quickly and Efficiently

CAREFULLY fitted out with the latest types of machine tools and other equipment needed for electrical repairs, the first unit of the new Coney Island repair shops of the Brooklyn-Manhattan Transit Corporation is in use. When completed the entire group will form the largest and best equipped electric railway inspection and repair shops in the world. Seven buildings are now in the course of erection, with a total floor area of nearly 13 acres. They comprise a main repair shop, an inspection shop, the electrical repair shop, which is the subject of this article; a two-story storehouse, a two-story office building, an oil house, and a boiler house. The total floor area of the seven buildings is 546,000 sq.ft.

The buildings themselves are being built by the city of New York under subway contract No. 4, while the railway company provides the equipment, including heating, lighting, power, machine tools, cranes, elevators, etc. The building now used for the department of electrical repairs is the first one to be completed and the city is now proceeding with the construction

of the remainder of this comprehensive group of repair and inspection shops. The yards for these shops occupy the entire space between the Sea Beach and Culver lines of the railway at Avenue X and extend south to Coney Island Creek. The electrical repair shop occupies the northeast corner of this area immediately adjacent to the Avenue X station of the Culver line and but a short distance from the 86th Street station of the Sea Beach line. The shop building is 300 ft. long and 127 ft. wide. The central portion is open from floor to roof and a mezzanine floor 32 ft. wide extends along one side of the building with a space for a similar mezzanine to be built later on the opposite side. Particular attention has been devoted to providing large central sawtooth skylights and an unusual amount of wall space for windows so as to make the interior of the shop exceptionally light throughout the daylight hours and a most attractive place in which to work.

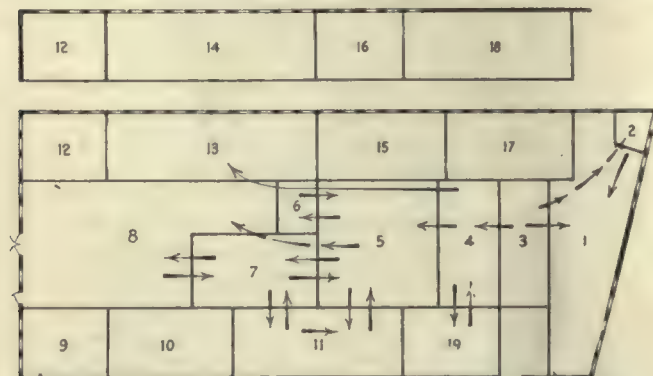
The framework of the electrical repair shop is of steel and the walls of tapestry brick with a concrete foundation. The building presents a very pleasing



Provision Has Been Made for Expansion and Installation of Additional Equipment to Meet Increased Requirements.
The Equipment Indicated by Means of Dots Has Not Been Installed

appearance with little attempt at ornamentation. The coping is of terra cotta and window sills are Rowlock brick. Windows are all fitted with steel sash. Ventilating panels in the exterior steel sash are glazed with $\frac{1}{2}$ -in. rough wire glass. Other glazing in the first story is $\frac{1}{2}$ -in. rough glass and the second story exterior steel sash is glazed with clear glass except in the ventilating panels. Roof lights are glazed with $\frac{1}{2}$ -in. rough wire glass. The roof over the center bay is of sawtooth design which furnishes abundance of interior light. The backs of the sawtooth section are of precast interlocking cement tile with glass inserts. The roof over the mezzanine floor and side bay is built of concrete slabs on steel with asphalt surfacing. The floor of the mezzanine section is of cement with an asphalt finish. The ground floor is of Carter Bloxonend flooring on a concrete base.

Unit heaters are located at intervals around the shop and wall radiators where required in rooms, etc. The heating system is of low-pressure type with vacuum return, steam at about 5 lb. pressure being used. Steam is now supplied from a temporary boiler, but



Departments Are Grouped so that Work Moves Progressively. Operations Performed in the Various Sections Are Given in the Table Below

as soon as the main boiler house is completed connection will be made to this.

All electric lighting fixtures are arranged to conform to the latest practice in shop lighting. The central bay is lighted from five-light clusters about 30 ft. above the floor and spaced on 20-ft. centers, each cluster consisting of five 94-watt lamps with porcelain reflectors. Side bays are supplied from single 94-watt lamps 10 ft.

above the floor, with porcelain reflectors spaced on 8-ft. by 10-ft. centers. In the washroom and locker rooms 56-watt lamps are used. There are also separate circuits for watchmen's lights, fire apparatus, fire alarm and hydrant designation lights. The 600-volt direct-current system of the railway is used for lighting, five lamps being connected in series across the line.

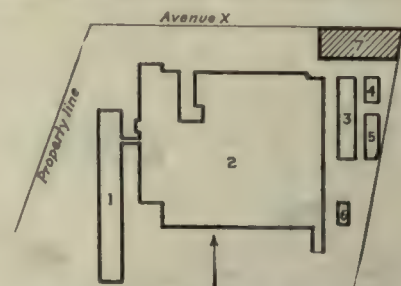
All wire is run in conduit in the ceilings, floors and walls with pull boxes at convenient intervals. A general lighting and power switchboard is located on the south balcony of the shop. From this the circuits run to separate lighting and power panels at convenient points in the shop. These control panels are provided with Westinghouse safety switches mounted in steel cabinets with hinged doors.

Pipe trenches are provided for the distribution pipes for steam, air, gas, electricity and water. Pedestals are placed along each side of the central section of the shop devoted to stripping and winding of armatures. These pedestals include connections for gas, air at 90 lb. pressure and electricity at 110 volts a.c. and 600 volts d.c. Some further details as to the construction of these stands and the convenience for various classes of work will be given in connection with the shop equipment.

Electric railway maintenance men will find the new electrical repair shop of the Brooklyn-Manhattan Transit Corporation of particular interest because of

the modern equipment provided. The shop is arranged to handle the largest as well as the smallest item of electrical repair work rapidly and efficiently. Quick repairs to electric car equipment are necessary, not only to keep the maximum number of cars in service continually, but also to minimize the number of spare parts that must be stocked.

In planning the department of electrical repairs, particular attention was given to grouping departments and equipment so that the part being repaired will



General Layout of Shops

The department of electrical repairs, shown as No. 7, is the first building completed. Others in the group are: 1, Inspection shop. 2, Main repair shop. 3, Storehouse. 4, Office. 5, Oil house. 6, Boiler house.

Schedule of Work in Various Departments of B.-M.T. Electrical Repair Shop

(Figures after section numbers are approximate areas)

Section 1—3,480 Sq.Ft.
For repairs to controller equipment, contactor boxes, switch groups, line switches, magnets and door equipment.

Section 2—277 Sq.Ft.
Control storeroom. Material necessary for repair parts made up in Section No. 1.

Section 3—2,093 Sq.Ft.
Shipping department.

Section 4—1,798 Sq.Ft.
Armature stripping department. Stripping of armatures. Rewinding and repair of coils.

Section 5—3,306 Sq.Ft.
Rewinding of heavy armatures. Soldering and banding of armatures previous to baking.

Section 6—450 Sq.Ft.
Soldering pots. All armature windings above 10 hp. are dipped.

Section 7—1,944 Sq.Ft.
Banding department. Armature banders. Armatures cleaned and slotted.

Section 8—5,466 Sq.Ft.
Machine shop.

Section 9—1,287 Sq.Ft.
Shop offices.

Section 10—1,980 Sq.Ft.
Testing department. Motors and control equipment are tested with high potential apparatus and certain types are given an actual running test.

Section 11—2,040 Sq.Ft.
Dipping and baking room. Impregnating tanks for field coils and all dipping and baking requirements.

Section 12—2,500 Sq.Ft.
Storeroom for insulating material, wire and complete coils.

Section 13—3,170 Sq.Ft.
Field coil work.

Section 14—3,170 Sq.Ft.
Mezzanine floor. Winding room for armatures, magnets and all other small coils, steam coil presses installed so that armature coils can be completed except for dipping and baking.

Section 15—1,920 Sq.Ft.
Men's room.

Section 16—1,280 Sq.Ft.
Women's room.

Section 17—1,920 Sq.Ft.
Laboratory. Tests of all material for electrical, maintenance and general repair shops for physical and chemical properties.

Section 18—2,528 Sq.Ft.
Storeroom for laboratory.

Section 19—1,490 Sq.Ft.
Cleaning room for various motors and control before dismantling.

move progressively from one operation to the next and all interference, cross-routing and back-tracking of parts will be eliminated. Provision for expansion and installation of equipment to meet future increased requirements has been made. Plenty of space has been left around machine tools so that equipment can be handled efficiently without interference. Speed in mak-

brought into the shop, is used for the receipt and shipping of all equipment and material. Armatures, the repair of which constitutes a large part of the work done at this shop, are inspected as they are received and are divided into two general classes—first, those that require complete rewinding, and, second, those that can be repaired without rewinding. All armatures are

moved into section 4 by cranes or trucks and are placed on adjustable stands manufactured by the Columbia Machine Works. These have a large steel bell-shaped base with roller-bearing cradles at the top. Two such stands support an armature. One is bolted securely to the floor, while the other is left free to be moved so that adjustment can be made to take care of various lengths. The head with the cradle has a screw bottom with square threads to provide a 10-in. height adjustment. A convenient height used for repair of

armatures is with the roller bearings 36 in. above the floor level. In grouping the stands, the stationary ones are spaced 6 ft. apart. A winder's tool box and material stand of sheet steel is attached by hinged supports to the stationary armature stand. This is 15 in. wide, 18 in. long and 8 in. deep. It is provided with a sheet-steel drawer which can be locked. Space is provided in the

Equipment for Rolling Armatures in Insulating Varnish Is Shown at the Left and the Impregnating and Mixing Tanks at the Right



The Flash Boiler at the Left Supplies Steam for the Impregnating Room—Batteries of Shop Trucks Are Charged from a Motor-Generator Set with Convenient Switchboard Shown in the Center

ing repairs with an economical shop force has been sought. Quick movement of heavy parts is taken care of by a 5-ton Box traveling crane which spans the central bay and traverses its entire length, by two 1½-ton Box traveling wall jib cranes, operated from the floor, and by several small storage-battery trucks. The wall jib cranes serve the machine tools so that the traveling crane can be used for longer movements and for placing material conveniently to machines.

An accompanying plan shows the shop divided into sections so as to illustrate the efficient manner in which work of similar character is grouped. A table lists the work done in each section. Lines with arrows show progressive movement of parts during repairs.

Section 3, with a track over which cars can be



Automatically Controlled Drying and Baking Ovens Are Important Parts of the Equipment

armature repair section for a double row of winding stands on either side. But one row on each side is in use at the present time.

The armature rewinding and repair section is provided with twelve outlet pedestals. To these are brought pipes containing gas and compressed air and



Short Circuits or Grounds Inside or at the Rear End of Commutators Are Repaired at the Bench

the conduit with wires for connection to both alternating and direct-current supply sources. Each pedestal has an upright circular steel base of 8 in. diameter and 29 in. high with a cast steel bottom. On top of the pedestal is mounted a square outlet box, $8\frac{1}{2}$ in. x $8\frac{1}{2}$ in. x 4 in. deep. The four sides are provided with proper fittings so that connection can be made quickly for gas, air, direct current and alternating current. Small brass plates on top of the cover indicate to the workman just which connection is to be used for each supply. There are six of these outlet pedestals, spaced 12 ft. apart, on each side of the armature rewinding and repair section.

Three soldering furnaces mounted permanently alongside the winding stands are used to heat irons for soldering the rear ends of some types of armature windings which cannot be dipped for soldering. Each soldering furnace has a gas connection and burner of sufficient size so that two soldering irons can be heated at one time. The furnaces are made by Charles A. Horn. They are mounted on a strap-iron stand which brings the furnace 2 ft. above the floor.

A SPECIAL ROOM FOR CLEANING

Armatures sent in for repairs usually need rebanding or new mica V-rings. Some single coils are replaced. If it is evident that an armature can be repaired without rewinding, it is sent to the cleaning room before dismantling. This room, shown as section 19 on the accompanying plan, is 19 ft. 6 in. x 14 ft. 9 in. and has two galvanized iron housings, 3 ft. x 3 ft. x 5 ft. long, into which the largest size railway armature as it rests on a truck can be rolled and be closed in completely during the cleaning operation.

Dust and grease caked solidly are loosened by scraping. Compressed air is played on the armature and a vacuum system sucks away all loose particles. The two receptacles are connected by 12-in. diameter pipes to a 16-in. diameter vertical pipe. The pipe from each receptacle has a damper so that one can be shut off while the other is in use. A hinged door the full size of the front of each receptacle is provided and to support the door as it is being opened a castor is fastened to the bottom corner farthest from the hinged side. The large front door is also provided with a small circular 15-in. door, and there is also a similar circular door in the opposite end of the receptacle. Another rectangular door 12 in. x 36 in. is provided in the side. These openings are for inserting the nozzle of an air hose to blow out the armatures. These cleaning

Machine Tool Equipment in Shop Devoted to Electrical Repairs for B.-M. T. System

- One 26-in. lathe, Monarch Machine Tool Company.
- One Peerless universal slotting, banding and commutator turning lathe.
- Two Le Courtenay Company's banding and slotting lathes.
- One Peerless slotting and banding lathe.
- One banding tension machine.
- One 15-in. lathe, Sebastian Lathe Company.
- Two drill presses, W. F. & John Barnes Drill Press Company.
- One commutator slotter, Electric Service Supplies Company.
- One 8-in. Lo-Swing lathe.
- One No. 3 Little Giant horizontal key seater, Mitts & Merrill.
- One No. 5 Little Giant vertical key seater, Mitts & Merrill.
- One punch and shear, Ferracute Machine Company.
- One double-spindle grinder, Ransom Manufacturing Company.
- Two motor-driven grindstones.
- One 200-ton horizontal press, Hydraulic Press Manufacturing Company.
- One 50-ton vertical press, Watson Stillman Company.
- One 60-ton horizontal press.

receptacles are also used for cleaning numerous parts of electric car equipment, such as motor parts, controllers and the like.

Suction to remove the dust and loose particles is provided by a motor-driven fan mounted on the balcony, which serves as a roof for the cleaning room. The refuse material is drawn from the receptacles up through the vertical pipe to a Cyclone separator, in which large particles and any heavy material drop down and through an 8-in. pipe to a steel drum 24 in. diameter by 3 ft. high, which is placed in one corner of the cleaning room. The hood from the pipe fits over the top of the steel drum and is held in close contact by a large steel ring so that there is no tendency for the dirt to fly about the room. The top of the Cyclone separator is connected by a large pipe to a large dust chamber. Light particles are drawn through this and to the exhaust side of the fan, where they are blown outside the building.

After cleaning, armatures which are to be repaired are tested at 1,400 volts a.c. with a Westinghouse por-



The Cleaning Room Has Two Large Galvanized Iron Housings Into Which Armatures on Trucks Are Rolled for Cleaning

table transformer box which is arranged to give testing voltages up to 6,000 in steps of 200. The box is brought to the armature to be tested.

REPAIRING AND REWINDING ARMATURES

With all coils removed, the armature core is repaired. Any sharp corners or rough edges in the slots that might cause damage to the coils are filed and the slots are cleaned carefully to receive the insulating material for the core. The armatures are next moved to section 5 and the commutators are tested with 3,000 volts to ground and 550 volts between bars. Where repairs to the commutator are necessary these are made and the commutator is tightened carefully. Should there be short circuits or grounds inside or at the rear end which cannot be repaired properly with the commutator in place it is pressed off. This is done in section 8. A 200-ton horizontal-hydraulic press made by the Hydraulic Press Manufacturing Company and a Watson-Stillman vertical press of 50 tons capacity do most of this work. A 60-ton horizontal hydraulic press is used for tightening collars, putting tension on commutators while the nuts are tightened and for removing pinions. These presses are also used for pressing shafts in and out and other forcing operations.

Repairs to commutators removed from the armatures are made in section 13. Unless a commutator is in very bad condition it is the practice to replace the same one on an armature. The armature under repairs is set aside meanwhile. With the commutator again in place, the armature is brought back to section 5 for rewinding.

To show the particular uses to which the various pieces of equipment are put in the department of electrical repairs would require a detailed description of each maintenance operation. The principal repairs made to an armature, however, will illustrate the need for much of the equipment. While armature repairs constitute a large part of the work done, the different steps in rewinding and the order in which the work is completed differ somewhat with the various types of armatures. For a large Westinghouse type 300 armature rewinding operations are as follows:

ARMATURE REPAIR WORK OUTLINED

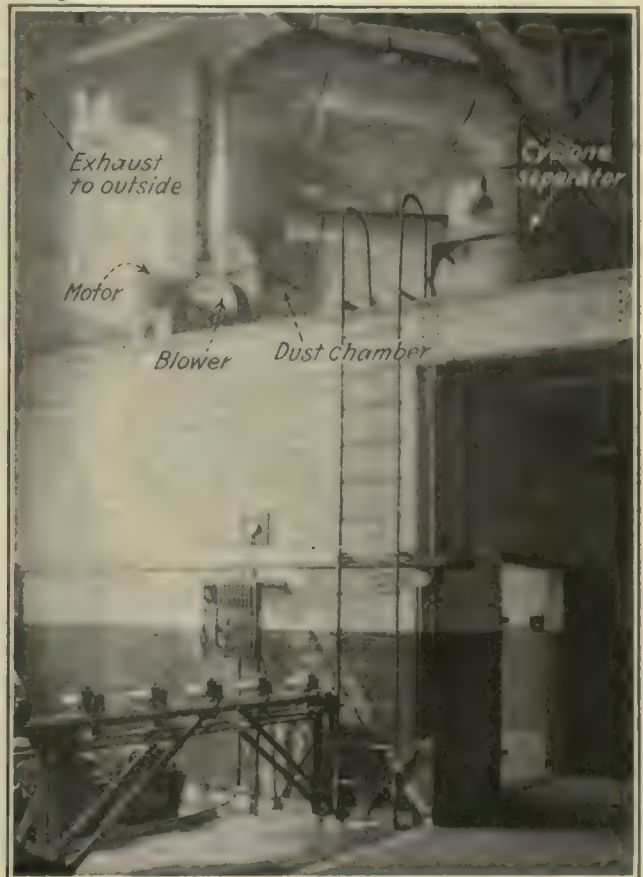
The winder puts in the bottom coils and tapes them down to hold them in position, properly lined up. The armature is then placed in one of the baking ovens for two or three hours, in order to heat it up. Sticks are then put in on top of the coils and temporary bands are applied while the armature and coils are hot. After cooling, the armature is again placed on a stand in the winding section. The winder cuts the temporary bands and removes them, together with the sticks. Insulation is then inserted above the bottom coils and the top coils are placed in position. The armature then goes into the oven a second time for heating up and again sticks are placed over the coils and temporary bands force the coils down into position. When cold, the armature is again placed on stands and the temporary bands are cut and the sticks taken out. The winder then does the finishing work on the armature and it is given a buzzer test. The armature then goes to the solder pot for the dipping to solder the leads into the commutator neck. After a bar-to-bar test permanent bands are put on and the armature is again submitted to a buzzer test. If this latter test shows trouble in

the winding, a bar-to-bar test is made to locate definitely the point of trouble.

The armature then goes into one of the lathes for turning and slotting the commutator. The slots are raked out and the commutator is polished. The armature then is sandpapered and another buzzer test is given it. The core of the armature is then painted and the tape band is given its final coat of varnish. A pinion key is put in the armature shaft and the pinion nut applied. The armature is then ready for service.

DRYING AND BAKING OVENS IMPORTANT PIECES OF EQUIPMENT

From the foregoing outline it will be seen that drying and baking ovens are used extensively. These are located in a separate room in section 11, adjacent to which is another room with a complete dipping and im-



A Motor-Driven Fan and Cyclone Separator Mounted Above the Cleaning Room Remove All Dust and Loose Material

pregnating installation. At present six ovens have been installed and there is space for an additional one when the volume of work demands it. Five of the ovens are 10 ft. x 6 ft. 6 in. x 6 ft. high. Their floors are arranged to come flush with the shop floor so that trucks can be rolled directly inside. A sixth oven is arranged for baking coils and small parts. It is 6 ft. x 5 ft. x 34 in. in size. The opening in this oven does not extend to the floor. This oven, together with four of the others, is of Gehnrich Indirect Heat Company's type. The sixth oven, formerly used at the railway's 52d Street shop, was made by the Oven Equipment & Manufacturing Company. The heating and control equipment for all of the ovens was furnished by the Westinghouse Electric & Manufacturing Company. The control boxes are installed on an angle iron framework along the wall

of the oven room, directly in front of the ovens. A regulator, used in connection with an indicating and recording meter which is set for definite temperature limits, gives automatic heat control and eliminates the personal element.

The impregnating room has a mixing tank and an impregnating tank, supplied by the P. J. Devine Company, also equipment for dipping armatures by the rolling method and a very complete overhead I-beam hoist system for handling heavy pieces of equipment. Steam at 60-lb. pressure for heating the compound is furnished by a 4-hp. flash boiler made by P. M. Lattner Manufacturing Company. The mixing and vacuum tanks are jacketed for the steam. No pipes are in sight to become covered with compound and make cleaning difficult. The compound is heated in the mixing tank and a partial vacuum is obtained in the impregnating tank by means of air pumps. The equipment to be impregnated is then subjected to a 28-in. vacuum before the impregnating compound is admitted.

With the compound properly heated and mixed, the valve between the two tanks is opened and the compound runs into the impregnating tank. Peepholes in the top covers of these tanks permit the operator to watch the compound as it rises and shut off the valve when the equipment has been covered over to a depth of from 18 in. to 24 in. After closing the communicating valve the vacuum is relieved and air pressure is supplied by the shop air compressor at from 50 to 55 lb. Compressed air is also used in forcing the compound out of the impregnating tank and into the mixing tank, the maximum pressure used being not more than 5 lb. The vacuum tank used in this installation is 36 in. diameter by 56 in. deep. Both tanks are surrounded by an elevated platform so that workmen can reach all parts without difficulty.

Lehigh Valley Transit Modernizes Cars

Interior of One City and One Interurban Car Remodeled to Increase Comfort and Attractiveness
—New Seats, Improved Lighting and Pleasing Decorative Scheme Adopted

HAVING faith in the future of trolley transportation within the city of Allentown, Pa., and the surrounding communities, together with a desire to exploit an idea of making the interior of cars more comfortable and attractive induced the Lehigh Valley Transit Company to remodel the interior of two of its cars.

The interior of the chair car which operates between Allentown and Philadelphia was completely renovated. The bell cord traversing the center of the car, which always presented a rather unpleasant appearance, was moved to the side and the many individual ceiling lamps were replaced with five 94-watt compensating dome lights giving a softer and more even light distribution. The compensating panel is located neatly and conveniently in the bulkhead. The fixed fiber chairs were removed and more comfortable green plush upholstered revolving chairs were substituted in the main section, as well as comfortable genuine leather upholstered swiveling chairs in the smoking compartment. A floor covering of green plush carpet with a center runner of Kemi-suede and an interior finish of walnut grain with buff headlining blend with the upholstery

and create an atmosphere of attractiveness and cleanliness.

Interior changes of the center-entrance 900 type city car were of a somewhat broader nature. Removal of the rattan seats and the installation of deep-pitched extra comfortable seats, covered with genuine Spanish grain



One of the 900 Type City Cars Has Been Remodeled to Give Greater Comfort

leather, have not only made riding a pleasure but have impressed the riding public. The register rods and pull cords are conspicuous by their absence since their replacement by the electric register system. The dull buff headlining and the five 94-watt compensating dome fixtures give the ceiling a very neat and pleasing appearance. Covering all platform apparatus and piping with metal paneling and camouflaging the bells, buzzers, sign box, reset switch, etc., into the walnut grain finish are other attractive features.

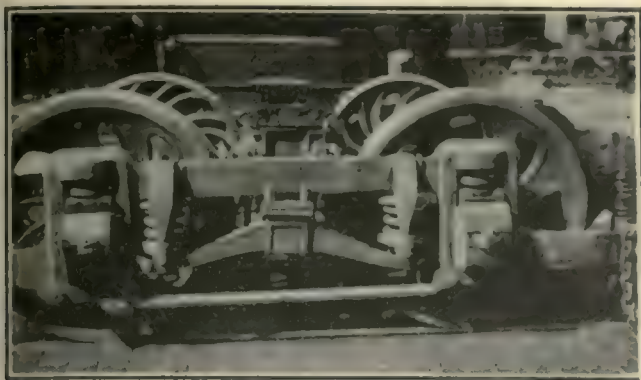
The coal stove has been replaced by electric heaters of the Railway Utility Company's type. Window curtains, which invariably showed signs of rain discoloration, were removed and the top half of the sash glass were



An Appeal to the Car Rider Is Made by the Attractive Appearance of This Remodeled Chair Car of the Lehigh Valley Transit Company

painted brown, giving the external appearance of partially drawn curtains.

The interior of the car, with its walnut grain finish, comfortable seats and the dark tan painted stanchions, metal work and seat ends, presents a very harmonious arrangement and coloring and should act as a stimulant to intensify the riding habit.



Side View of Brill 27-G Truck Purchased in 1900 Before Rebuilding



This Truck Has Side Frame Broken at Pedestal Joint

Excessive Noise Eliminated by Rebuilding Trucks

Worn Frames Were Built Up by Welding—Pedestal Jaws Were Strengthened and New Type Journal Box with Longer Bearing Was Installed

BY REMODELING and rebuilding some Brill 27-G trucks the Grand Rapids Railway, Grand Rapids, Mich., has decreased troubles in service and eliminated excessive noise. The trucks were standard equipment on cars purchased in 1900 and 1906 and had seen severe service.

In rejuvenating the trucks they were entirely dismantled and the side frames were carried to the welding department, where all worn or cupped portions were filled in and ground off. Considerable trouble had been experienced with these frames breaking through the pedestal guides at the outside end. The driving motors were outside hung and their weight on the extreme end of the truck end frame undoubtedly contributed to this breakage.

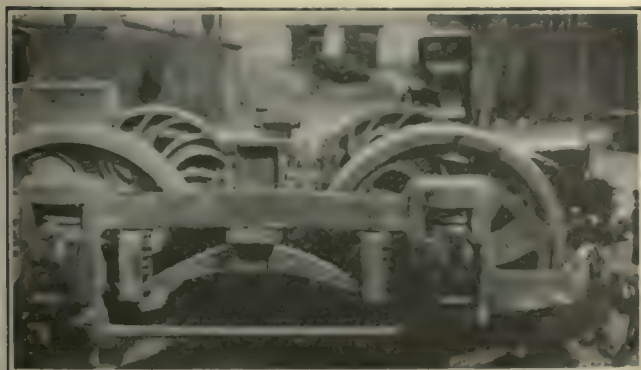
To strengthen the side frames at the outside pedestal jaws a piece of 1½-in. square bar steel was welded to the frame so as to form a diagonal brace. This brace extended along the top of the truck pedestal and then

diagonally to the outside edge of the side frame, it being fastened securely by welding. Its installation has eliminated breakage at this point.

The cost of welding braces on the side frames of a two-motor truck was as follows:

Material:	
9-lb. Banox welding steel	\$2.25
6 gal. kerosene for preheater .....	.78
226 cu.ft. oxygen	3.05
237 cu.ft. acetylene	6.16
16 lb. of 1½-in. square steel .....	.53
Total cost of material	\$12.77
Labor:	
Preheating welds, five hours	\$3.50
Welding, five hours	4.00
Blacksmith work, one hour	0.65
Total cost of labor	\$8.15
Total cost of labor and materials.....	\$20.92

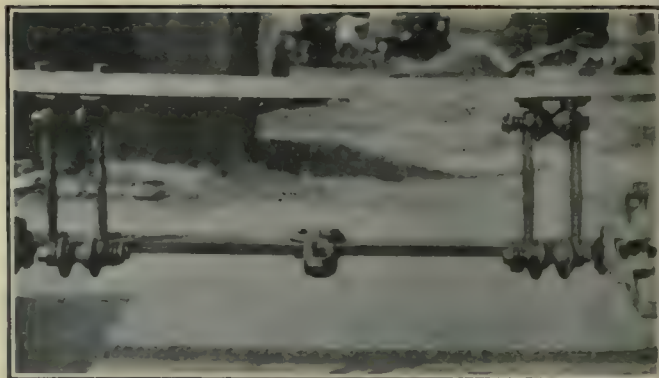
In some cases old type motors were replaced by a more modern type where these were available. One of



At Left—Side View of Brill 27-G Truck After Being Rebuilt. At Right—Truck with Diagonal Brace and New MCB Journal Boxes. The Brace Extends Entirely Across the Top of the Journal Box Pedestal and Along the End of the Truck Frame. Crack in Frame Has Been Welded



Old Type Brake Hanger and Brake Hanger Carrier

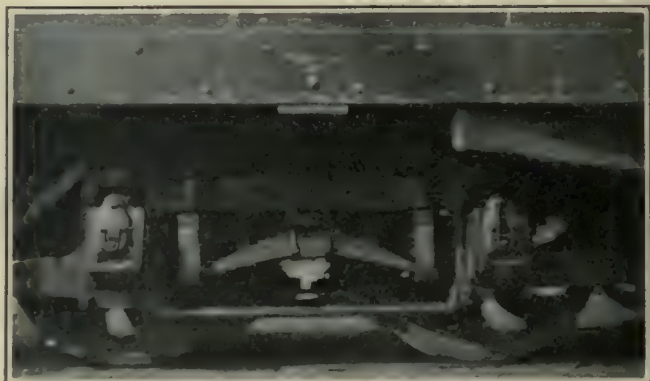


New Type Half Ball Brake Hangers as Installed

the illustrations shows a truck strengthened and rebuilt, with GE-203 motors installed in place of GE-57 motors. This change, of course, required some changes in the type of motor suspension. In order to decrease the vibration and do away with excessive noise fiber insulation was inserted wherever steel is laid on steel. Old type brake hangers and brake hanger carriers were also removed and replaced by half-ball brake hangers with 12-in. centers.

NEW JOURNAL BOX PERMITS USE OF A LONGER BEARING

At the same time as the other remodeling was done a new type journal box was installed. With the old type box a 2½-in. length journal brass was as long as could be used. This type required a check plate. The new journal box permitted the use of a journal brass 7½ in. long. Breakage and troubles from hot journals were done away with due to the increased length. The new journal box also made inspection and lubrication easier and cheaper. The new journal box is No. 333-MCB and it fits into the pedestal jaws without change. With the old type of brass wear was excessive at the



Brill 27 Truck After Being Rebuilt

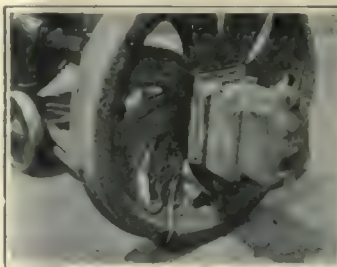
end next to the check plate and this resulted in a tilting up of the end. With the new brasses a full length bearing is obtained so that there is much less wear and the results obtained indicated an average of 2½ times as much service from the new bearings as from the old. Strengthening of pedestal jaws has eliminated breakage, new journal boxes and brasses have stopped hot bearings and the fiber insulation has reduced noise.



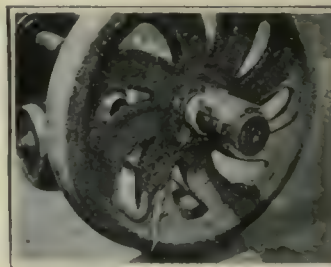
Old Type Journal Box Which Was Discarded



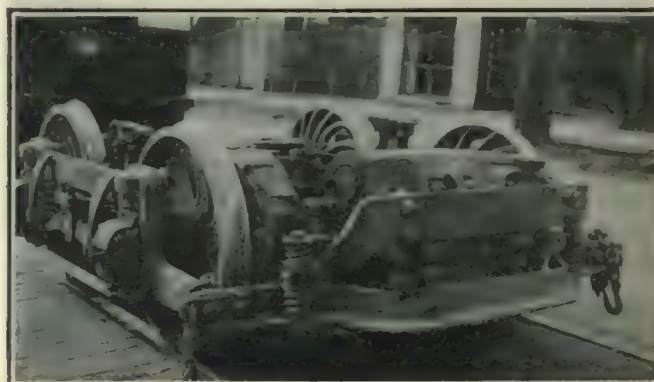
Old Type Journal Brass with Check Plate



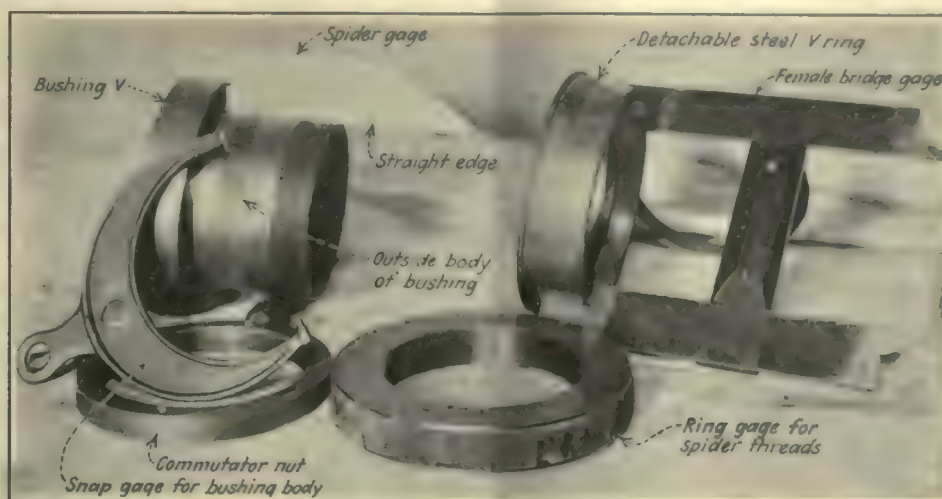
New Type 333 MCB Journal Box



New Journal Brass 3½ in. x 7 in.



At Left—End View of Overhauled Truck as Equipped with GE-203 Motors. At Right—One of the Rebuilt Trucks Equipped with GE-57 Motors Which Require a Suspension Bar Above the End Frame



Details of the Commutator Spider for a Westinghouse 514-A Commutator with the Necessary Gages for Machining and Measuring the Different Parts

Mica V-Rings and Bushings Have Important Functions in Commutators*

The V-Rings Must Be Made of a Bond Which Will Not Squeeze Out Under Pressure, but Which Will Soften When the Commutator Is Heated so the Ring Will Be Plastic

By Jesse M. Zimmerman

Renewal Parts Engineering, Westinghouse Electric & Manufacturing Company

THE mica V-rings used in commutators are different from the mica strips in bond characteristics. Mica used for making V-rings must be made with a bond which is not seasoned completely. The ring must remain plastic to a certain extent in order to give yielding effect to the commutator when it passes through the alternate cycles of heating and cooling.

The shape and size of a mica V-ring are very important features in a commutator. The mold upon which it is made must conform accurately in dimensions to the steel V. If the mold is too large the outer surface of the molded V-ring will wrinkle between the bars, leaving an opening. If the mold is too small the V-ring will break when the commutator is assembled.

Mica V-rings were originally made in one piece the shape of a V, as illustrated in form I of an accompanying illustration. This shape of V-ring did not give sufficient creepage distance from the commutator to the spider for 600-volt railway motors. By making a flange on the ring the creepage distance was greatly increased. But at this stage of development it was impractical to mold this type of ring at a reasonable cost. This led to the development of the two-piece ring as shown by form II.

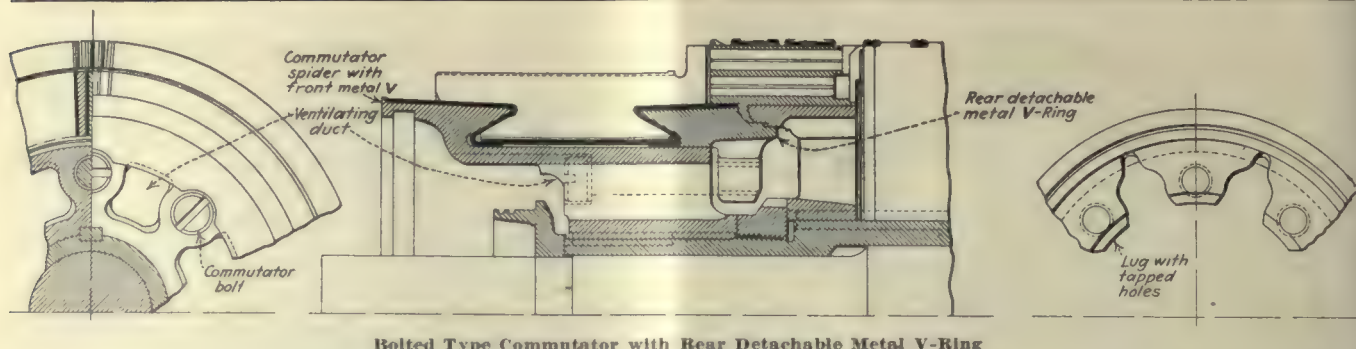
The two-piece mica V-ring consists of a 3-deg. tape bushing and a 30-deg. molded V-ring with a bent flange. The longer the flange the greater was the creepage distance. The copper V's are machined with a groove at the bottom of the V to allow an opening for the joints

of the two rings when the commutator is being assembled. Theoretically the joint of the two rings makes a perfect seal. On high voltage motors this joint does not permit sufficient creepage distance. Some trouble was experienced with grounds at this point and this led to the development of a one-piece mica V-ring with a flange, which is being used on all modern railway motors. These are shown as forms III-A and III-B. In molding mica V-rings of this type fingers are cut to enable the mica to be molded around the bends of the flange. Several layers of these strips are staggered accurately in order that the openings between the fingers will be covered by the next layer.

The two-piece mica V-ring was easier to make in small sizes as it was molded from a mica plate which was the exact thickness of the finished ring. These rings have a small variation in thickness of ± 0.001 in. A one-piece ring may have a maximum variation of ± 0.005 in. The reason for this is that the one-piece ring is made of several layers of mica each 0.010 in. thick. Each layer has a variation of ± 0.001 in.

Accompanying illustrations show two mica V-rings, which had been in the same commutator, heated to 150 deg. C. and assembled with 25 tons pressure. A 500-watt lamp was placed back of each mica V-ring. The opening around the flange of the rings was sealed with black paper to keep all light of the lamps from the picture except the light which penetrated the mica V-ring. The views were taken looking directly at the 30-deg. face of the rings. The mica V-ring which has a light circle shows clearly where the pressure of the copper and steel V squeezed the bond out of the mica. The light color shows that the thickness of the ring

*This is the fourth article in this series on commutators. Others were: Choosing Materials for Railway Motor Commutators, published Aug. 8; Important Considerations in Replacing Commutator Bars, published Oct. 23, and Accurate Machining of the V's of Assembled Commutators Is Essential, published Nov. 20.



Bolted Type Commutator with Rear Detachable Metal V-Ring

has been reduced by the shifting of bend and mica. At one point the mica in this ring was less than 0.010 in. thick. The other ring shows no signs of light at all. These rings represent what a mica ring should not be and should be respectively.

Important features of mica V-ring construction include: (1) Accurate staggering of the fingers, (2) a bond which will not squeeze out under pressure, (3) a bond which will soften when the commutator is heated so the ring will be plastic, (4) a ring of the same size as the steel V-ring so that the mica will not wrinkle and (5) no slippage of mica in front of the copper or steel V's.

The mica bushing is probably the least thought of in a commutator, yet it has a very important function to fulfill. In order to decrease the diameter of a commutator it is essential that the commutator bars fit close to the spider. By placing an insulating bushing over the spider the distance between the segments and the spider body can be made smaller.

This bushing is sometimes placed inside of the flange of the V-ring, as shown in form III-B, or the flange of the V-ring may fit in the bushing, as shown in form III-A. Either construction will give the same results and is equally accessible in assembling. The bushing is omitted on low-voltage motors where dirt and moisture are not prevalent.

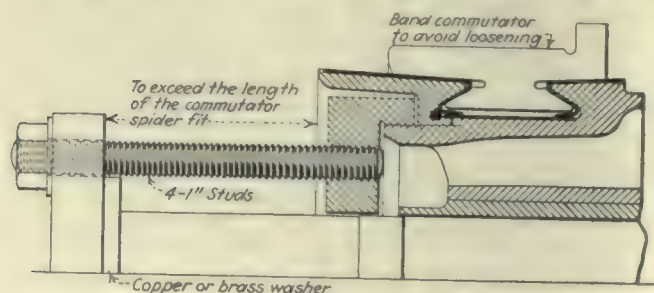
It has been the practice in the past to make these

bushings out of mica plate. In later years micarta bushings have been found to be just as serviceable and can be supplied at a lower cost. Therefore, micarta bushings have been replacing to a large extent mica bushings on commutators used on motors up to and including 600 volts.

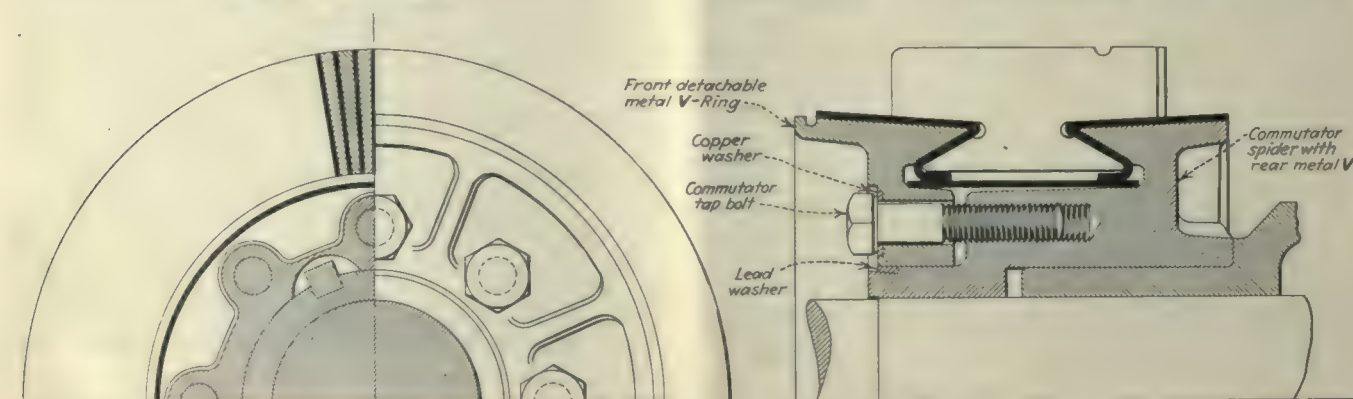
The chief consideration in the design of commutators is to keep the parts together while in service and prevent high bars. This is accomplished by the commutator bushing, which is the foundation. For small commutators the ring-nut type of bushing is used very extensively. However, in larger commutators of this type some difficulty is experienced in railway shops in obtaining a tight commutator, due to the fact that a pressure is not applied to the steel V-ring before the ring nut is drawn tight. Some believe the bolted type of commutator can be tightened without applying a pressure to the steel V-ring. This is not a good policy to follow, as the assembly will not be as tight as it should be unless pressure is applied to the V-ring after the assembly has been heated.

The bushing consists of three parts, the spider, which contains one of the metal V's; the detachable metal V-ring, and the commutator nut or bolts for holding the detachable metal V-ring under pressure. The original commutator spiders were made of cast iron. A great deal of difficulty was experienced with breakage. This difficulty was eliminated by making them of malleable iron or cast steel.

A building without a good foundation is undesirable. A commutator without an accurately machined bushing is just as undesirable. The accuracy of the machining is the most important part of any commutator, as the mechanical stresses can be taken care of by changing to metals which have higher mechanical strength. The first machining operation on the spider is the surfacing of the outside of the body. This surface must be machined to a very accurate dimension, as it is from this surface that the attached metal V's are machined and gaged. The body is measured by a snap gage. The attached metal V is then machined, after which it is



Method Recommended for Pulling Off Commutators with Ring Nut Construction



Bolted Type Commutator with Front Detachable Metal V-Ring



Two Mica V-Rings Which Were Placed in a Commutator Under Identical Conditions, Such as Same Pressure and Temperature. The light section of the ring in the illustration at the left shows squeezing of bond and the slippage of mica due to the pressure of the copper and metal V's. No slippage of mica or squeezing of the bond occurred with the ring shown at the right.

gaged by a spider gage in the following manner: The straight edge of the spider gage is laid upon the body so that the 3-deg. and 30-deg. angles of the V will fit in the V of the spider gage. The depth to which the V is bored is measured from the intersection of the extended side of the 3-deg. and 30-deg. angles of the gage to the rear of the spider by a steel scale. It is very important that the depth of this V be machined accurately, for the rear V must locate the assembled segments accurately.

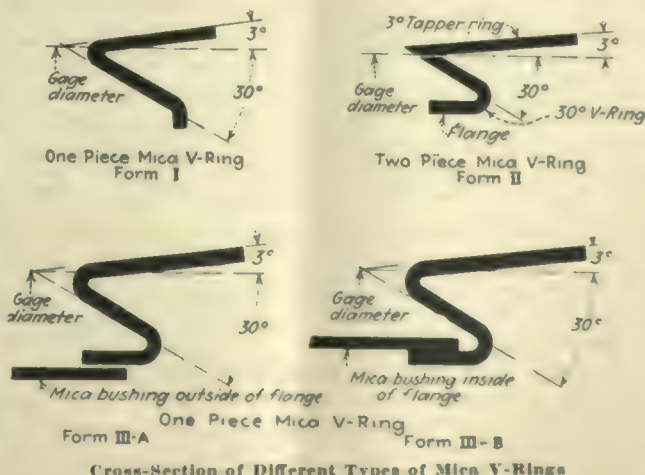
On most commutators the detachable metal V-ring is the front V-ring. However, some commutators have this detachable ring at the rear. The detachable metal V-ring is gaged by a female bridge gage, which determines the accuracy with which the 3-deg. and 30-deg. faces are machined. The detachable V-ring must fit over the body of the spider with an "iron to iron" fit. It is important that it must not have any more clearance than is necessary for it to slip along the body during the assembling process of the commutator. This will prevent any movement of the detachable V-ring, thus throwing the commutator out of line. The V of the detachable V-ring is measured by a permanent female bridge gage. The ring nut type of commutator has the threads machined on the spider. They are gaged by a ring gage. It is important that the threads be accurately machined so that the ring nut will turn true on the bushing, thus giving equal pressure at all points of contact between the commutator nut and the detachable V-ring when they are assembled.

The bolted type of commutator has been very popular in the railway field, because it is easier to assemble and tighten. However, the use of the bolted construction

is confined to the larger types of commutators. This is made in two designs, one with the metal V-ring detachable at the front, the other at the rear. The front ring is more common. It is held to the spider by eight or more tap bolts, equally spaced. A groove is machined in the spider to make the commutator oiltight. After assembling a lead washer is swaged in the groove to close the joint. A copper washer under the tap bolt head keeps out oil at that point.

Where it is necessary to have the large overhanging front metal V, it is a better mechanical design to cast the front metal V as part of the commutator spider. The detachable metal V-ring is at the rear of the commutator; this ring has eight or more tap lugs for the commutator tap bolts, the spider being drilled. This design, in addition to increasing the mechanical strength, lends itself more readily to an increase in the size of the ventilating ducts without increasing the diameter of the commutator.

A method used effectively for pulling the spider of the bolted type commutator from the armature spider is that of placing a steel plate with four equally spaced stud bolts against the end of the shaft, as shown in one of the illustrations on page 1090. By tightening the nuts on these bolts sufficient pressure will be exerted by the bolts to pull the commutator spider off the armature spider. This same method can be applied to the ring nut type of commutator by making a special ring nut as shown in an accompanying line cut. The four equally spaced holes are drilled and tapped in the ring nut for the pulling off bolts to be screwed into. This type of puller is very simple and can be made in any railway shop.



Cross-Section of Different Types of Mica V-Rings

Heavy Track Built in Los Angeles

DURING the past seven years more than one-third of the track mileage of the Los Angeles Railway has been rebuilt according to an extensive program adopted immediately following the period of the war. This work has been carried on since, but not intensified as during the first three years.

Each year finds the company with better track, the new having a life of approximately twenty years built into it. The company's standard construction specifica-

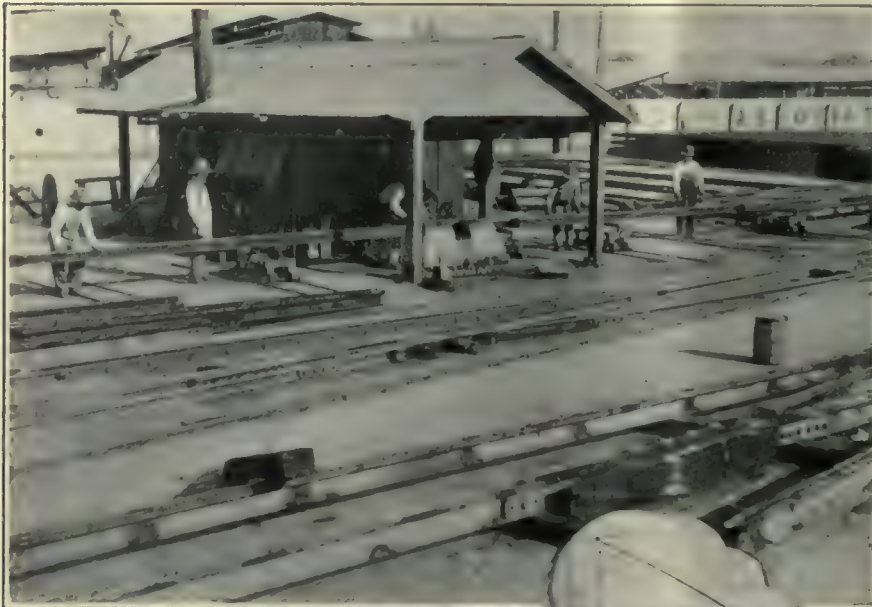
During this season the department places about 700 men on the work and in that way clears it all up in a very short time.

Two types of trackwork are done. One is the rebuilding of old track which has been in service for such a period as to require new rail and new roadbed. The other is reconstruction work necessary because of the change of street grades by the city. Much of this is now being done by the city in providing storm sewers. In some places a change of grade of 12 ft. has been necessary. As such work cannot be anticipated in advance, it is not included in the budget prepared by the department. However, all reconstruction of old track is prepared for in advance and carried in the budget.

Reconstruction work must be done under traffic. A short period in the early morning hours can be utilized for cutting out of certain portions of the track. However, it is impossible, due to the automobile congestion, to keep a track or portion of the street out of service during the day. In some locations, work can be done on one side while a single track movement can be maintained on the other. For this purpose portable crossovers

Flat Car Provided with Cross-overs

A set of portable cross-overs are kept on a flat car ready for an emergency call because of the heavy floods encountered in the rainy season.



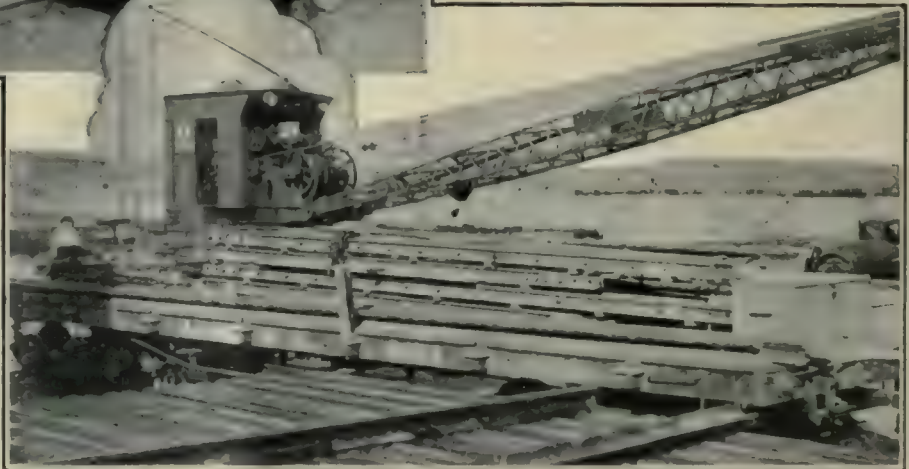
Laying Out Rail Construction

The material yard of the way and structures department of the Los Angeles Railway is used for the laying out of special work and the stocking of materials. The 350-ton hydraulic rail bender forms all curves used. A set of 100 radius boards furnish patterns for every curve used on the system.

tion calls for 116-lb. girder rail, with continuous joints, carried on creosoted pine ties. As this property is 3-ft. 6-in. gage, 6-ft. ties are used. The track is laid on a 6-in. concrete base supported by a 6-in. sub-base of tamped and rolled crushed stone, with a 2-in. asphalt wearing surface on top. This latter construction is standard for all streets in the city.

The practice of placing rows of brick on both sides of the rail was discontinued after comparative tests were made between track so constructed and track without such protection. The need for the bricks having gone with the disappearance of steel-tired vehicles, the former construction has been adopted at a saving of approximately 5 cents per square foot.

Trackwork is carried on each year in an intensive way between April and October. Although climatic conditions in Los Angeles permit outside work during the winter months, the rainy weather which prevails during November, December, January and February hampers the outdoor gangs. In any other city this rainy weather would not be considered an obstacle to outside work. However, between April and October it seldom rains in Los Angeles and it is therefore possible for the outdoor track gangs to work every day.



are used. These are not only valuable for this purpose but also for the single-tracking or rerouting of cars during the rainy season when the streets become flooded.

A large yard is maintained by the way and structures department where special trackwork is laid out and rails are bent to curvatures. The company purchases its special work from trackwork manufacturers, the type used having hard centers. Curves are formed out of the 62-ft. lengths of rail with a 350-ton hydraulic rail bender. Of the 700 or 800 tons of rail stocked at the yards, approximately 250 tons is of the guard rail type to go with the 116-lb. grooved girder rail. In the construction of track no special problems are encountered because of the narrow gage.

Electric welded, continuous joints are standard. An accompanying illustration shows a typical joint with the plate welded at the head and base of the rail. One bolt in each rail is spot welded to the plate at the head-end, the nut is welded to the plate on the other side and the bolt welded to the nut. This precaution tends

to eliminate loose bolts. In lining up track preparatory to welding, advantage is taken of the difference in temperature between day and night to secure a tight joint. The open end of the rail length is blocked each night when the temperature is low. The heat of the day then expands the rail, causing the joint to close up.



Type of electrically welded continuous rail joint used in Los Angeles with the 116-lb. grooved girder rail. The plate is electrically welded at the head and base of the rail while the bolt and nut are spot welded.

This is done for several days and then the plates are welded in position.

All sub-base work is tamped with air tampers and then rolled with a 5-ton steam roller. The concreting and surface paving are let out on contract. With an asphalt surface as specified, it requires an extensive asphalt plant and all of the equipment which goes with it to do this work. The railway, not having enough of it to warrant such an investment in plant and equipment, has the work done by an outside contractor.

The Readers' Forum

More Data on Paris Type L Car

THE J. G. BRILL COMPANY

PHILADELPHIA, PA., Dec. 8, 1926.

To the Editor:

I was very much interested in reading in your issue of Oct. 23 the editorial on "Changes from Conventional Truck Design Are Attracting Increased Attention," particularly with reference to reduction of unsprung weight. You are, of course, familiar with the fact that when electricity was first used as motive power for street railway transportation the motors were mounted on the car body and much difficulty was encountered. When John A. Brill, formerly vice-president of this company, developed the first system of electric car trucks in 1887 his mounting the motors on independent trucks, instead of the body as had been attempted, was considered a very progressive step, which fact is attested to by the general adoption of this practice.

Your reference to activities in Europe interests me very much, and I have made a very careful study of the articles published in the JOURNAL on the European cars where some experimentation has been made with the shaft type of transmission. I have not only read the article in your issue of Sept. 11 on the Paris cars, but also have read the article in the May (not May 26), 1926, issue of *L'Industrie des Voies Ferrées et des*

Transports Automobiles referred to in the JOURNAL article, and also the Proceedings of the Nineteenth International Congress, held in Paris June 16 to 22, 1924, which contains the details of the Paris tramways type "L" car referred to, in a report by H. Dubath, ingénieur de la Société Industrielle Suisse, Neuhausen.

In your Sept. 11 article you give the seating capacity of the Paris type "L" car as 49 passengers and the complete weight empty as 28,380 lb., while the weight per seated passenger is given as 580 lb. Reference to the above-mentioned proceedings, page 579, reveals:

"Les nouvelles motrices légères, type 'L,' de la S.T.C.R.P., tare 12.5 t., places assises 30, total des places 49, transportent elles, un poids mort de 415 kg. par place assise et 255 kg., par rapport au nombre total des places offertes."

According to our interpretation this reads that "the new light-weight motor cars for the Paris tramways, type "L," tare weight 12.5 metric tons (27,500 lb. and not 28,380 as given in your article); seating capacity 30 (instead of 49); total capacity 49; carry a dead weight of 415 kg. (913 lb.) per seated passenger and 561 lb. in relation to the total capacity."

There have been built in this country many four-wheel cars that seat more than 30 passengers and have a total carrying capacity greater than 49, the unsprung weight of which has often been several hundred pounds lighter than the 4,100 lb. given for these Paris cars, which are only light in respect to the former cars which the railway system operated. As your editorial apparently features the matter of unsprung weight I do not feel that these cars bear out your contentions and both the article and editorial lose much of their significance.

WALTER S. ADAMS,

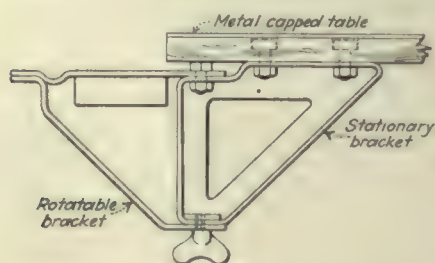
Designing Engineer.

EDITOR'S NOTE: Mr. Adams is correct in regard to the passenger carrying capacity of the type L car of the Paris system. In the magazine article abstracted, no division was given as to seated and standing passengers. The latest information on this car is given in a paper presented at the international convention at Barcelona, Oct. 10-16, 1926, by Paul Mariage, commercial manager of the Paris system. He gives the capacity of the car, when used as the head car in a train, as 30 seated and 19 standing. When used as the second car there is room for four more standing passengers. As to total weight empty, different figures have been published from time to time, due possibly to slight changes in the methods of construction or more probably to the equipment included. The paper by Mr. Dubath at the 1924 Paris convention, quoted by Mr. Adams, gives "tare" weight 12.5 metric tons, or practically 27,500 lb. The magazine article abstracted in the JOURNAL gives for the latest type at that time 12,900 kg. or 28,380 lb. This was the figure published. Mr. Mariage's 1926 report, mentioned above and just received, gives 12,800 kg., or approximately 28,160 lb., as the total weight, empty, with complete tool equipment, full sand boxes and windows in place. According to American standards most continental European cars are not particularly light per seat or per passenger carried, due to two causes. One is that many cars are narrow so that only three instead of four passengers can be seated across the car on cross seats. This is true in all Paris surface cars. The other is that the number of standing passengers is limited. Thus, in the car in question, no passengers are allowed to stand in the aisles, but only on the end platforms and in the center well. The point made in the editorial was that changes from conventional practice in the direction of the European experiments mentioned may offer the opportunity of reducing unsprung weight. The editorial also commended the value of this research work being carried on in Europe. The entire art of gear and transmission design and manufacture has made long strides since the early days of body mounted motors mentioned by Mr. Adams.

Maintenance Notes

Disappearing Armature Winding Stand

THE accompanying illustrations show a disappearing type of armature winding stand used while re-winding the smaller sizes of armatures such as are used in compressor motors in the department of electrical repairs of the Brooklyn-Manhattan Transit Corporation. The support consists of two hinged



Construction of Disappearing Armature Winding Brackets

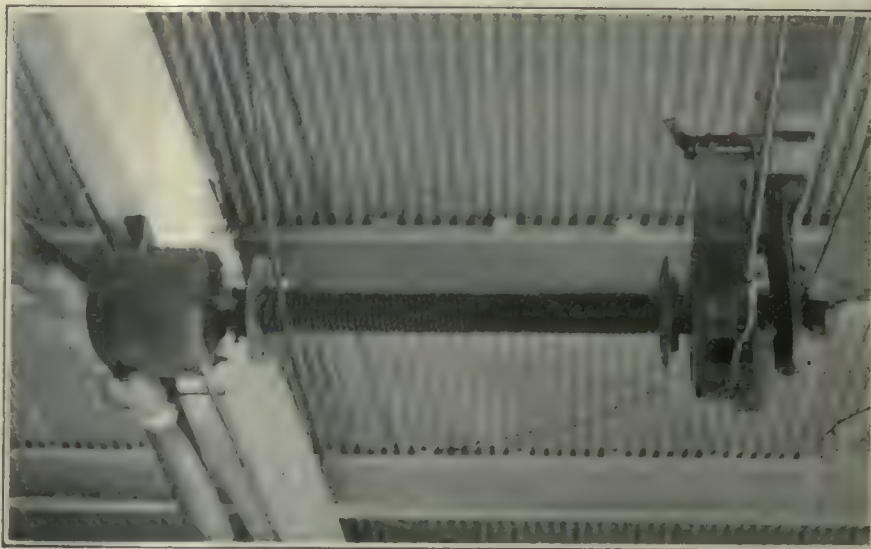
brackets which can be swung under the bench when not in use. In the illustration showing the construction only one bracket is shown. In case the armature shaft should be too short to span the distance between the supports small lengths of pipe are used to increase the effective length

of the shaft. These are slipped over the ends of the original armature shaft.

In the construction used a stationary bracket is bolted to the underside of the winding bench. The bracket which supports the armature is hinged at the top and bottom of the stationary support so that it rotates readily and can be swung out of way or adjusted to convenient positions.



Armature in Position for Rewinding Supported by Two Disappearing Brackets at the Winding Bench



Motor-Operated Hoist Ready for Service

Air Compressor Motor Used for Lumber Hoist

HANDLING of light incoming lumber from the ground floor of the shop to the storage space located in the balcony of the Jamestown Street Railway shop in Jamestown, N. Y., is done by a motor-operated hoist installed in the balcony. Certain parts needed for the hoist construction were on hand, and as the cost of assembling these parts was much less than a manufactured product, K. L. Connor, master mechanic, decided to build the hoist in the shop. Material used included an Allis-Chalmers air compressor motor, a 5-ft. x 1½-in. shaft, a 12-in. pulley with a 6-in. base, a standard line shaft bearing and a 6-in. leather brake.

The armature of the Allis-Chalmers air compressor motor was pressed onto the end of a 1½-in. round shaft about 5 ft. long. A 12-in. pulley with a 6-in. face was keyed securely to the shaft 1 ft. from the other end. The assembled unit was installed and lined up on the ceiling of the gallery. The extended armature shaft with auxiliary parts is supported at one end by the

"Rattles and bumps" will accelerate your cars over the dumps.

motor end bell bearing and at the other by the line shaft bearing.

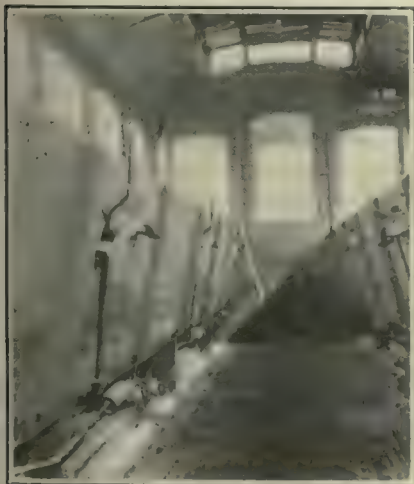
One end of the 6-in. x $\frac{1}{2}$ -in. leather belt is wrapped around the pulley and the other end is connected to a $\frac{1}{2}$ -in. iron rod which is fastened to one end of a fulcrum casting about 6 ft. away. The fulcrum casting is connected to an adjustable hand rod which permits most any desired leverage with corresponding friction upon the pulley to be obtained. With this arrangement the load can be held or dropped as desired.

The speed of the motor is controlled by varying the resistance in the armature circuit. Direction of rotation is regulated by field reversing switches conveniently located. This hoist is doing most satisfactorily the work for which it was designed and its use has resulted in speeding up the lumber handling.

*Systematic Oiling "Safetyfies"
Thus reduce your "S.O.S." cries.*

Sand Car with Six Hopper Outlets

SIMPLIFICATION of rail sanding methods and continuity of sand flow have been considered of such great importance by the York Railways, York, Pa., that a special sanding equipment was designed and constructed. A single-truck passen-

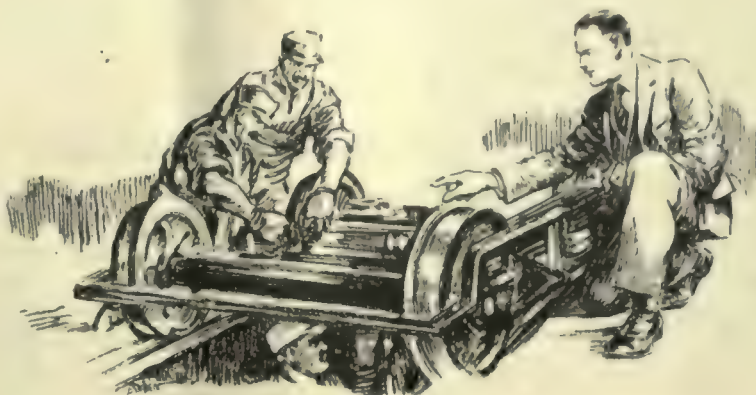


Sand Bin and Hopper Operating Levers

ger car, having served its usefulness, was stripped of all internal fittings. Two large sand bins were constructed along either side throughout the entire length. Each bin can accommodate 5 cu.yd. of sand when filled to capacity and is made of

Dick Prescott Inspects an Overhaul

and Sees a Wood Block



STEVE WHITE, carpenter shop foreman, was worried about the mutterings that he had heard among the men in the Consolidated Railway & Light Company's shop. He lost no time in voicing his uneasiness to Dick Prescott, young assistant superintendent, for whom he had developed a deep regard and friendship.

But Dick was not disposed to take the subject seriously. He felt that it was entirely natural for some of the men to question the wisdom of his appointment, after so brief an experience, and almost dismissed the subject from his mind on leaving the little carpenter shop office. Steve, however, continued to feel grave concern for his friend Dick.

Absorbed in the job of improving maintenance practice, Dick went on out to the overhaul shop, where one of the largest group of cars on the property was being put through as rapidly as the cars could be taken out of service. Several gangs of men were at work on this job and Dick stopped near one of the trucks to look over the work.

"How do you find them, Joe, in pretty bad shape?" queried Dick, addressing the workman in charge of the gang.

"You bet, bad," grunted Joe. "Big job to fix 'em."

"Guess you're right, Joe. They went too long without any real attention and now they're pretty well shot, eh?"

"Yeh," again grunted Joe in assent.

"How fast are you fellows going to get them through the shop?"

"Slow work," said Joe. "Too unhandy here to get much done. Have to fool around lot. Only two tracks here. Cars in way. Too much time jacking up and down. Lose lot's time. Cost lot's money."

"Yes," agreed Dick, "I can see that, all right. You have to get the cars on

this track all up on horses to get the trucks out. Then the men on body work back there have to do a lot 'of climbing up and down to get in the cars. We need a car hoist or crane here pretty bad."

"Need it bad," repeated Joe.

Dick continued to watch Joe and his men as they proceeded systematically with their work of dismantling the truck. He noted that the gears were badly worn and that they showed evidence of lack of proper lubrication.

"Do you find many of the gears in bad shape like that?" he asked.

"Yeh, lot's of 'em. Gear cases all shot and some trucks no cases at all."

"That's a nice mess," said Dick. "What's the matter with them? Don't we have enough gear cases to go around?"

"Knock 'em all off," was Joe's comment. "Track on Main Street in hell of a shape. Paving all shot and busts gear cases every day."

"Well, that's going to be different soon, Joe. They're working on the Main Street track now and it will be in first-class shape in a few weeks. That means we've got to go after these trucks right now that we've got a chance to do so. Are there plenty of gear cases in stock?"

"Yep," replied Joe.

"All right. Make sure every truck is fully equipped when it leaves here, with plenty of grease on the gears. Then I'm going to get after the car-houses to make sure they keep them that way."

At this point one of the men unbolted the center bearing and removed it from the bolster.

"What do they have that wood block under the bearing for?" asked Dick, suddenly interested.

heavy yellow pine planking reinforced by substantial oak timbers.

Three Brill sand hoppers are a part of each bin, having exits in front of and between the wheels directly over each rail. Operation is by individual hand levers installed on the front of the bin and held in a latched position by a notched circle plate. This is mounted directly in front, thus permitting any desired degree of sand flow. The operating handle normally is held in the off position by a heavy coil spring at-

*You may forget your dignity,
but don't lose your "bearings."
Watch your babbitting.*

tached to the lower extremity of the lever. This multiplicity of sanding outlets has eliminated the constant shoveling of sand into the hoppers, decreased the possibility of failure and has permitted the operator carefully to observe the results obtained by the sanding equipment.

84½ Per Cent One-Man Operation Reached in Scranton

ONE hundred per cent one-man operation is the aim of the Scranton Railway, Scranton, Pa. When the ten two-man cars now being rebuilt in this company's shop are completed for one-man operation 84½ per cent one-man operation will

have been attained. Two of these have been completed and the remaining eight are well under way. Such parts of the old body and equipment have been used as were found suitable for further service and which would conform to the design adopted.

For economical reasons new framing was constructed with side and end sills of long-leaf yellow pine reinforced by well-seasoned oak cross framing. The sills employed are somewhat heavier than are ordinarily used on cars of this type and weight, being of 7½-in. x 9-in. and 5½-in. x 10-in. material respectively. Siding consists of ½-in. steel plates securely screwed to the posts. Rat-tan seats removed from the old cars were utilized. They consist of twelve cross and four longitudinal seats to provide for 45 passengers.

Old equipment of GE-80 motors with K-28 control and straight air brakes was completely overhauled and reinstalled. New safety devices of the National Pneumatic Company were adopted. An added safety feature is that of an adjustable observation mirror installed on the vestibule



Interior View of One-Man Car Showing Motorman's Unobstructed View



Completed One-Man Car with Motorman's Observation Mirror



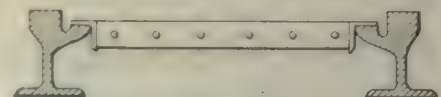
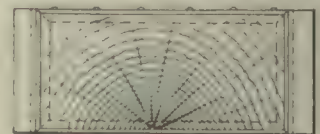
Underframing of One-Man Cars Being Converted in Shop at Scranton

post which permits the motorman to obtain a clear view of the rear step of the car under all conditions.

The coloring of the outside of the car is orange with cream trimming and the inside is white veneer with cherry trimming. These color combinations give a very pleasing effect.

Carhouse Pit Planks Reduce Accidents

OPEN car pits or insecure pit planks are always a source of serious danger to the men working in and about a shop. This has been eliminated to a great extent in the



Protected by a Frame of Angles the Pit Plank Fits Accurately Between Rails

shop of the Harrisburg Railways, Harrisburg, Pa., by the adoption of a rigid non-shifting pit plank, designed by the company.

This plank consists of a piece of 1-in. x 14-in. oak securely incased in a frame of 1-in. angles. Pieces of 1½-in. angle are welded to the backs of the angles at the ends, with the top flush with the top surface of the plank. The over-all dimensions of the plank with its framing are just sufficient to permit it to drop between the rails without any lateral motion and the length over the supporting angles allows for wheel flange clearance. This plank affords a ready means for the men to pass across a pit. There is no necessity to raise it to permit of truck passage as is the case when planks are laid

on top of the rail. Again, danger of breakage and slippage is minimized, as no lateral motion is possible and flange clearance is provided. Since these planks have been in service pit accidents have been reduced greatly.

Refuse Receptacle for Car Floor Sweepings

MAINTEINING a clean appearance of the shop floor of the Valley Railways, Lemoyne, Pa., is given constant attention by the organization. Suitable containers placed in convenient locations throughout the shop for the reception of refuse ma-

handling of the refuse but keeps it from being scattered over the shop floor, from where it would be tracked still further by the workmen.

New Equipment Available

Automatic Welding Insures Better Workmanship

INCREASED use of automatic arc welding is being made in electric railway repair shops because the welds produced are reliable and the human element in welding is decreased. To meet the needs for an automatic welding machine, the Westinghouse Electric & Manufacturing Company, Pittsburgh, Pa., has brought out the Auto-Arc.

A large field of usefulness for the new automatic machine, it is stated, is for welding and building up of worn surfaces, such as those on brake equalizers, and other brake rigging parts. For this purpose the Auto-Arc is mounted on the carriage of a lathe so that it can be moved along the work either by hand or by the lead screw, with an adjustable driving speed. The brake equalizer or other part is placed on the lathe and the sides are held in position

temporarily by a clamping device. The operator starts the machine, and with the work remaining stationary the welding is performed as the Auto-Arc moves along and deposits a seam of metal.

Another use for which the new welding machine is adapted is that of

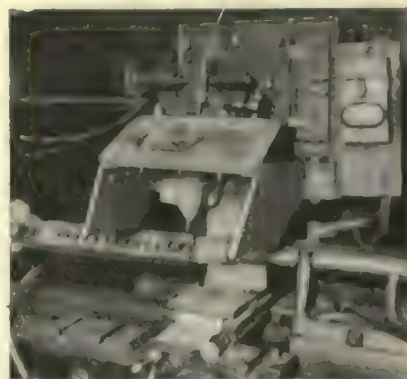


Receptacle in Position to Receive Car Floor Sweepings

terial, together with a receptacle to receive car floor sweepings, assist greatly in this.

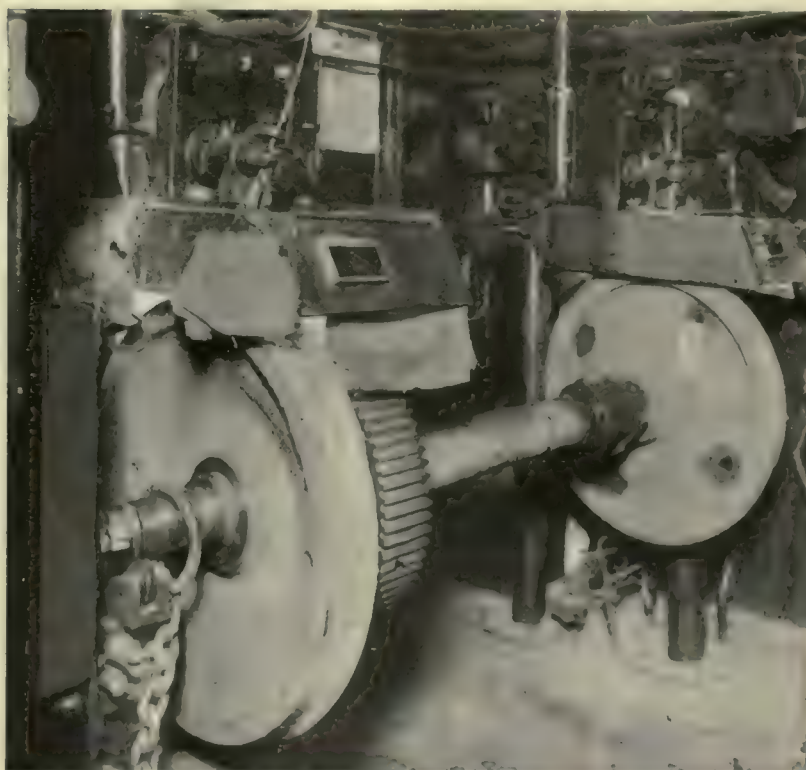
This receptacle is made of No. 16 gage galvanized iron having a base dimension of 8 in. x 15 in. and a sloping top. The maximum height is about 18 in. and the minimum such as to permit of sliding under the platform flooring, while the container rests on the car step. Suitable handles are provided for carrying.

Placing the receptacle on the car step for the reception of the floor sweepings not only eliminates double



Equalizer Bar in Place on Lathe with Auto-Arc Ready to Start Welding Operation

building up worn flanges of steel wheels used in city service. The worn wheel is placed in a device that consists of two stationary pedestals on which the car wheels are free to rotate. The wheels are driven by an attachment to the axle through a reduction gear, which in turn is driven by a small motor. The Auto-Arcs are mounted on a stationary pedestal and are free to swing as desired by the operator. As the wheels revolve



Worn Car Wheels in Position for Welding Automatically

*The electric railway and your car journals
Both deserve careful thought as to their internals.*

the Auto-Arcs deposit the metal at a peripheral speed of about 10 to 12 in. per minute. A set of car wheel flanges can thus be built up in approximately 2½ hours.

Electric Snow Melter for Track Switches

BY JOHN M. BOND

Transportation Division, Westinghouse Electric & Manufacturing Company, New York, N. Y.

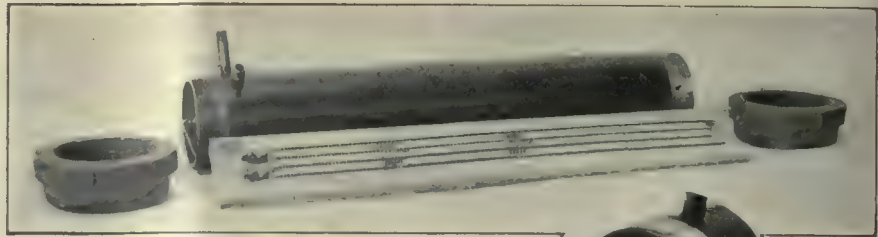
KEEPING track switches open and operative during snowstorms can be accomplished best by keeping the points and mechanism above a freezing temperature. For this purpose the Westinghouse Electric & Manufacturing Company has brought out an electric snow melter. This was developed for and is now used extensively by the Interborough Rapid Transit Company, New York. The switches on the Interborough are of the automatic type, controlled from towers. During severe snowstorms they are liable to give trouble due to freezing or clogging with snow unless they are kept clear. The method used in the past was by shoveling and sweeping, but this requires a large force of men and equipment which must be held available for such emergencies during the winter months, and consequently is very costly and none too satisfactory.

The snow melters eliminate this manual work by giving off sufficient heat to melt the snow as soon as it reaches the ground and also to keep the switch movement from freezing. The number of men needed is reduced to a minimum of perhaps one or two, their only duty being to see that the current is properly turned on when the snowstorm begins and to inspect the switches occasionally

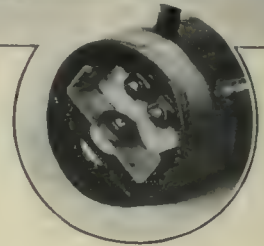
to make sure that all circuits are functioning. This method is not only much more reliable and less expensive but it is obviously much less hazardous than having a large number of men shoveling and sweeping out switches during a blinding snowstorm within a foot or two of a live 600-volt contact rail.

The snow melters are designed to withstand extremely rough handling, such as being struck with picks and shovels. The heater element is made up of two coils, about ½ in. in diameter, of nickel-chromium wire connected in parallel and supported in four grooved porcelain blocks which are held firmly in a sheet steel trough running lengthwise through a standard 3½-in. black steel pipe, 2 ft. long. The trough is sherardized to prevent rusting and is attached by insulated bolts to cross bars which are welded inside the pipe at each end.

Both terminals are at the same end of the pipe. Two standard pipe nipples located just above the terminals provide entrances for the connecting wires, which are sealed with tape and compound into the nipples, both outer and inner edges of which are beveled to prevent damage to the insulation of the wires. The ends of the pipe are equipped with standard light-weight pipe caps, red leaded to



Electric Snow Melter Dismantled to Show Construction



make the units watertight. By removing the end cap nearest the nipples the two terminals are exposed and are easily accessible for the purpose of connecting the units during installation. A steel terminal clip welded to the outside of the pipe provides a means for grounding the case of the unit.

The units supplied to the Interborough Rapid Transit Company were designed to operate twelve in series on a 650-volt, d.c. circuit, this being the number of units used at a switch. Connected in this manner each unit consumes 1,200 watts or a total of 14,400 watts per switch. Since the power used by the snow melters is proportional to the square of the applied voltage, the heat given off will, of course, vary accordingly. The current is taken from the contact rail through a fuse and a single-pole, single-throw knife switch directly to the units, each track switch equipment being supplied with its own knife switch and fuse so that it can be controlled independently of the others. Six units are placed under each switch point, the switches on this property being of the double blade type. In certain cases, however, depending on the curvature of the switch, the number of heaters used may vary from twelve to twenty. Also one heater is placed under the switch movement.

The heaters are laid horizontally on the roadbed between approximately alternate pairs of ties and parallel with them, beginning at a point just ahead of the switch blade and proceeding back toward the heel of the switch. All cases are grounded to a common wire. They are located not less than 1 to 2 in. below the bottom surface of the track as a precaution against interference with the automatic signal circuits if the casings of the units should come in contact with the rails.



The Switch in the Foreground Is Equipped with Snow Melters in 148th Street Yard of Interborough Rapid Transit Company, New York City, During Severe Snowstorm. The Rear Switch Being Swept Out by Workmen Has No Snow Melters

Association News & Discussions

Snow Fighting in New England

Symposium Presented at Recent Meeting of the New England Street Railway Club Considers Methods of Keeping the Lines Open in Bad Weather so as to Increase Passenger Riding

DISCUSSION at the last meeting of the New England Street Railway Club, held in Boston on Dec. 2, was devoted largely to the subject of snow fighting. This was mentioned only briefly in last week's issue. In introducing the subject President F. D. Gordon emphasized the change in attitude of street railway men. Formerly they were satisfied to obtain sufficient revenue in the summer months to carry the road through the year. Nowadays, when rail transportation furnishes greater convenience than automobile transportation in the winter, January, February and March are the best revenue producers, and attention must be given to keeping the tracks open and the cars as nearly on schedule as possible. Four papers on this subject, by Messrs. Scott, Flanders, Bolt and Lockman, are abstracted elsewhere in this issue.

In the discussion Mr. Scott stated that crews make particular note of any excavations or unfinished street work prior to snow storms. Any obstructions that might interfere with the snow plows or wings are given particular attention. He also believes that an ordinance should be passed prohibiting automobile parking along the curb for 24 hours succeeding a snow storm. This would permit the city and company to clean up the streets quickly and would not only help the schedules but would help the public.

Both sweepers and plows are used by the Connecticut Company, according to Mr. Scott. Sweepers are not as satisfactory now as before the automobiles were on the streets. With the temperature low and starting with the beginning of a storm the sweepers will do good work. They are also used in the heat of the day after the snow is loosened up.

Low spots and grooved rails are salted, depending on storm conditions, while the track is salted right along. In a heavy storm with the temperature dropping the amount of salt used is greatest. The coarse grade of salt is used. Salt is distributed in 100-lb. bags in Providence and in 56-lb. bags in Connecticut. In 56-lb. bags it costs \$15.71 a ton, in 100-lb. bags \$13.80 a ton and in bulk some \$5 or \$6 a ton cheaper. The reason given for favoring the use of smaller bags than 200 lb. is the greater ease of handling.

In the absence of Mr. Flanders, his paper was read by H. J. Sullivan, superintendent of line and track Springfield Street Railway. Mr. Sullivan stated that better results are obtained in Springfield with sweepers than with

plows. Rattan and steel mixed are used in the brooms. Canvas guards are used with the sweepers, to prevent breakage of windows or injury to pedestrians. Ice cutters with teeth are used to advantage. In Springfield the city assists with traction snow plows by pushing the snow directly over to the gutters, thus keeping the street clean. This year the city will have 38 trucks and seven tractors for the work. On some streets the city does all the cleaning while on others the railway handles it. The snow is dumped into the Connecticut River.

In Springfield several drivers of coal trucks have been arrested for stopping their vehicles on the car tracks and

obstructing the street. When the snow loaders are started out they are accompanied by police officers, who move all automobiles out of the way so that the snow can be loaded.

On the Eastern Massachusetts Street Railway, according to Mr. Bolt, the single-truck snow plows are not a very important factor. During wet snow storms the service should alternate with a plow trip following two or three round trips of sweepers.

Buscs that are equipped with scrapers can be operated in 3 to 4 in. of snow. After it gets deeper than that the scrapers are lifted and the roadway must be plowed with caterpillars or trucks.

The levelers of this company weigh about 1½ or 2 tons each, and are put on or taken off with the aid of crane cars. They are adjusted to the angle desired and then held in place by means of chains.

The Cumberland County Light & Power Company has also used levelers or wings on its plows. These are about 18 ft. long, according to G. C. Haggas, chief engineer. The use of the levelers has provided a place for automobiles away from the car track.

A rotary ice cutter developed by the Eastern Massachusetts several years ago was described by Mr. Glynn of that company. This machine cut so much ice that a platform was built out in front. After that an equipment was designed having a conveyor with 5-ft. blades. Not enough men could be put in the small space to shovel the snow off. Then a snow plow was designed built of steel and having solid steel blades raised or lowered by hydraulic jacks. A cross conveyor was put on. The plow was able to take off 1 in. of solid ice with a layer of 3½ ft. of snow for a distance of ½ mile in an hour and a half. The machine does not compress the snow, but lifts it.

Fighting Snow in Springfield and Worcester

BY H. M. FLANDERS

General Manager Springfield Street Railway, Springfield, Mass.

SPRINGFIELD and Worcester have street railway properties with similar physical characteristics. The total track mileage of the Springfield company is 203 and of the Worcester company 292. About half the mileage of each company is in center location in city streets, the other half being suburban lines, mostly of side location. Each company operates about 7,000,000 car-miles per year.

Snow-fighting organization and methods are practically identical on each property and are in charge of division superintendents. The transportation department is responsible for manning plows and sweepers, assigning

COMING MEETINGS

OF

Electric Railway and Allied Associations

Jan. 6-7—Midwest Electric Railway Association, midwinter meeting, Mayo Hotel, Tulsa, Okla.

Jan. 7—American Electric Railway Association, Metropolitan Section, Engineering Societies Building, New York City, 8 p.m.

Jan. 10-14—American Road Builders' Association, convention and road show, Coliseum, Chicago, Ill.

Jan. 18-19—Kentucky Association of Public Utilities, annual convention, Brown Hotel, Louisville, Ky.

Jan. 19-20—Central Electric Traffic Association, Fort Wayne, Ind.

Jan. 21-22—Central Electric Railway Accountants' Association, Fort Wayne, Ind.

Jan. 25—New York Electric Railway Association, winter meeting, Hotel Commodore, New York City.

Jan. 26-28—Association of Equipment Men—Southern Properties—Memphis, Tenn.

Feb. 3-4—Central Electric Railway Association, winter meeting, Toledo, O., Commodore Perry Hotel.

Feb. 7-10—American Institute of Electrical Engineers, annual convention, Engineering Societies Building, New York City.

Feb. 10—Central Electric Railway Master Mechanics' Association, Toledo, Ohio.

Oct. 3-7, 1927—American Electric Railway Association, annual convention, Public Auditorium, Cleveland, Ohio.

them to the lines and for keeping the lines open. The track department is responsible for the removal of all snow from streets where necessary and for keeping switches, yards, ditches and drains clear.

Each fall the division superintendents assign crews to certain lines. Each of the plows and sweepers sent out is manned by two or three uniform men, the third being a uniform man taken from the spare list.

The plows and sweepers so manned are sent out to the assigned lines as soon as the superintendents deem it to be necessary, a record being made on a sheet similar to a train dispatcher's sheet. Each crew has instructions to telephone the superintendent as often as practicable, posting him on conditions, and this information, with any special orders, is all recorded on the snow-dispatching sheet. All street inspectors report to the superintendent. Certain men are assigned to fixed strategic points, the remainder going to various points as required to act as the superintendent's representative on the job. The superintendent of tracks has authority to employ as many extra men and trucks as are necessary for his snow removal work.

As soon as the storm starts, the mechanical department assigns men to care for snow-fighting equipment. These men are on duty until the storm ends and attend to oiling, greasing and repairing as needed.

Springfield and Worcester each has one double truck rotary plow. These are rarely used; in fact, only in cases of extreme drifts. Springfield has four double-truck nose plows and five double-truck shear plows; Worcester ten double-truck nose plows and seven

tive operating of maintenance cost of plows and sweepers. We believe that the sweepers can be operated and maintained at a much lower cost than the plows. Practically no cars in Springfield or Worcester are equipped with snow scrapers.

The only special equipment on either property consists of snow loaders and automotive trucks equipped with plows, each property having one Barber-Greene snow loader. The loaders are very efficient and economical and we have averaged in an eight-hour day a 5-ton truck loaded every three minutes.

Experience in Snow Fighting on the Eastern Massachusetts

BY W. C. BOLT

Superintendent Rolling Stock and Shops Eastern Massachusetts Street Railway Chelsea, Mass.

EACH one of our thirteen division managers is fully responsible for transportation in his respective districts, including efficient and economical snow fighting. At the beginning of a storm, all sub-department heads are notified and requested to report immediately to the executive in charge, either the division manager or his division superintendent. It is our general plan to start fighting snow as soon as it is possible to man plow equipment. Delay in this respect has been found to be costly, and we very much prefer to operate our snow-fighting equipment early.

All paved track is covered first by sweepers. It is occasionally possible to cover all lines with sweepers and passenger car scrapers without using the

We have not used the trucks equipped with plows for plowing the tracks, but simply for throwing the ridges left by the plows and sweepers back into the gutters, where the snow can be handled by the snow loader.

We use salt in switches, and on practically all hills having grooved rail, catch basins and drains salting is begun as soon as the snow begins to fall.

The consumption of salt per mile of track per season for the last three winters was from 1,309 to 2,945 lb. per track-mile in Springfield and from 1,917 to 2,772 lb. per track-mile in Worcester.

president in charge of transportation, and one copy to the superintendent of rolling stock. This shows the hours and miles operated by each unit of snow-fighting equipment, the equipment failures, if any, the approximate inches of snowfall, the time storm began, the time storm ended, lines blocked and serious interferences with service, and an estimate of the total cost.

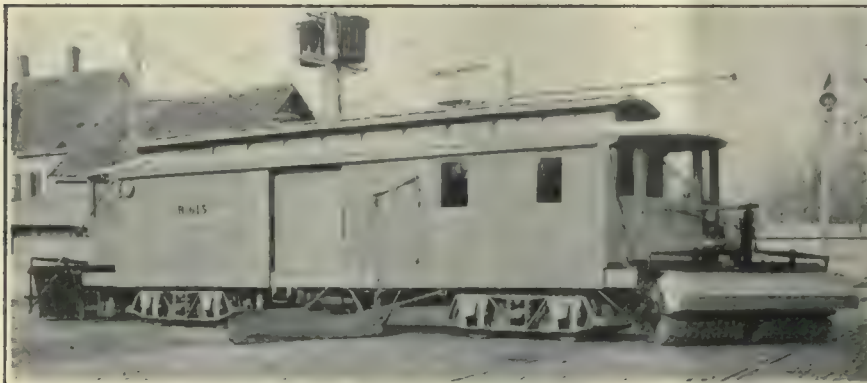
KINDS OF EQUIPMENT USED

We have a total of 88 double-track electric snow-fighting units to cover the 635 miles of paved and unpaved track, or an average of 7.2 track-miles per double-track unit. Electric snow sweepers have been found by us to be very efficient and particularly effective in snow storms with temperature under 20 or 30 deg. Sweepers are able to operate on paved track at relatively high speed, to clean thoroughly the street between tracks, and aid considerably in preventing the building up later of so-called "high centers." Sweepers, however, become less effective under heavy wet snow conditions, and it is then necessary to resort to plows. In unpaved track, of course, snow plows are very much more effective than sweepers.

The 23 passenger cars which have been equipped with Root scrapers have performed very satisfactorily. This type of unit replaces a regular passenger car, and at the same time clears the track zone of snow. It can cover more miles of track with one man than any other type of equipment, and is particularly effective in snowfall with temperature under 30 deg.

Our records do not give us information as to the relative cost of operating the several types of equipment. As between plows and sweepers, sweepers perhaps are slightly more expensive to maintain. However, we do not feel that this is an important item.

All of our snow-fighting units with the exception of Root scrapers, are equipped with levelers, and these are used to the maximum extent possible. In heavy, congested traffic, of course, the use of levelers would retard service. It is, however, important to level snow back from the rails as much as possible in order that automobile traffic will not find it necessary to use the tracks and



Eastern Massachusetts Sweeper Equipped with Leveler

double-truck shear. Springfield also has nine single-truck shears and three single-truck nose plows, while Worcester has three single-truck shears and two single-truck nose plows. Except in light snows, the single-truck plows are practically worthless unless operated with a pusher.

Springfield has two single-truck sweepers and nine double-truck sweepers. The former are used principally to keep our open air storage yard clear. Double-truck sweepers are used on the line. Worcester has thirteen double-truck sweepers. In both cities the double-truck sweepers are more efficient in practically any kind of a storm than are the double-truck plows. We have no figures of value as to compara-

heavier snow plows. Should the weather reports indicate a heavy snowfall, heavy plows are likewise placed in service without delay.

At the central headquarters, an accurate log is kept on which is recorded for each route the number of the plows, the time each plow started and the time it returned. It is generally planned to determine the exact location of every plow at least every 30 minutes. Plow crews have instructions to call headquarters by telephone if any unusual delay occurs. An automobile or taxicab is used in event a plow crew has not reported within a reasonable time.

After each storm, a report is prepared by each division manager, one copy of which is forwarded to the vice-

thereby seriously delay passenger service.

Five of our heavy double-truck work cars have been equipped with steel levelers, 12 ft. long and 3 ft. wide. These equipments have been found most efficient for leveling purposes, and are used almost exclusively at night after each storm.

We also have an electric equipment known as the Sampson Access Ice Cutter, which has been effective under certain conditions, particularly where lines have been completely snowed-in. This unit carries a cutting blade, a rotating picker, a main conveyor and a cross conveyor.

RELATIVE ADVANTAGES OF RAIL AND MOBILE EQUIPMENT

We have a rather large complement of equipment which is gasoline driven and not confined to rails, comprising: Seventeen Root scraper attachments for buses; fourteen Good Roads Machinery shear plow attachments for trucks; seven 5-ton Best caterpillar tractors for one-man operation equipped with Sargent steel-nose plows; one 7½-ton Walter tractor equipped with Good Roads Machinery shear plow and Walter center scraper. This equipment is intended primarily to care for the 116 miles of bus lines operated. The seven 5-ton caterpillar tractors have just been purchased, and it is our intention to use these tractors in conjunction with our electric snow-fighting equipment.

There is no question but what gasoline-driven equipment is of considerable advantage in temporarily taking care of a route which may be blocked by a stalled truck or otherwise. Traffic centers and street intersections can best be cleared of snow with gasoline-driven equipment.

Our average annual consumption of salt is approximately 475 tons, or three-quarters of a ton of salt per mile of track. Each plow is equipped with a number of barrels of mixed sand and salt. This mixture is used particularly on grades where iced condition of rail has made traction difficult. A mixture of sand and salt frequently seems to do better work in cutting ice than pure salt.

COST OF FIGHTING SNOW

Our expenditure for fighting snow as recorded in Account No. 12, and expenditures for cost of maintaining snow fighting equipment, Accounts No. 32 and No. 33D, have averaged \$198,499 per year for the last six years.

The total annual cost including fixed charges, based upon the average cost of the last six years, is \$295,500, equivalent to the revenue from 4,220,000 passengers. Our average annual expenditures for fighting snow including fixed charges would pay 58 per cent of our common stock dividend. Again it would pay our entire annual dividends on the first preferred stock. Twenty-five per cent of our total bond interest could be taken care of if we were not confronted with snow-fighting expenditures. All of these figures refer to the cost of fighting snow with electric plows, and do not include any costs in connection with plowing snow on our bus routes.

Snow Removal in Hartford

BY N. J. SCOTT

Manager Hartford Division the Connecticut Company

RAILWAY operators disagree as to the benefits of snow, and the only real answer to the question is our net revenue. We all agree that our gross is much greater in winter and at times of heavy snow, and if we can help one another to work out economical snow-fighting operation and removal costs it will be to our mutual advantage. The following is the procedure at Hartford, Conn., which has a population of 170,000 and a trading population of at least 250,000. The track mileage is 173.38.

When the storm begins a starter reports at the carhouse where snow-fighting equipment is housed and immediately thereafter crews report to him. Previously all snow-fighting equipment has been put in shape and loaded with salt. Each crew is given a route card and, barring sickness or some unavoidable occurrence, crews are assigned to the same routes and same equipment on each storm. The routes are so arranged as to get the most out of the equipment and the least possible time is lost in changing ends. This practice also improves passenger car schedules.

Starting with the storm again, two dispatchers divide up the lines by telephone circuits and control the movement of the snow-fighting equipment under the direction of the superintendent. Progress and difficulties are recorded at all times. Principals operating the equipment are well qualified for their work and keenly feel the responsibility of keeping their routes open. The crew starter provides relief

from the rail or to the gutter side. This leaves a good traveled highway, which helps us in subsequent storms and maintenance of schedules, as all vehicular traffic is not forced to the car track.

All cars are equipped with snow scrapers and are used to advantage not only at the time of storm but following the storms when vehicular traffic drags so much snow onto the rail and also in cases of slight drifting.

All of our snow-fighting equipment is confined to rails as we have not experimented with motorized snow-fighting equipment except on our own premises. There is no question but that equipment of this type would help in our general snow-fighting program, but we have kept away from it on account of additional burdens that might be placed on us by city, state and municipalities.

We have two cars in our track department which are rigged up to salt track; they also have route cards which cover our grooved type of rail, all switches and low rail in the city area. To my mind there is no question but what the proper application of salt is very essential, especially in heavy snow which is easily matted down by autos. After the salt is spread the snow loosens up and is easily removed by car scrapers or sweepers.

Each switch cleaner has a territory to cover and barrels of salt are placed at various locations on these routes. Each snow plow and sweeper also carries a supply of salt which is used in low spots and on lines not covered by



Former Eastern Massachusetts Express Car Equipped with Broom Sweeper

and lunches for the crews as required. We have four double-truck sweepers and two single-truckers. These are used effectively on city routes with improved pavement in handling light snow and in cleaning up after plows. They are also useful in the work of the day following storms in cleaning tracks subjected to the vehicular traffic. Shear plows are used on city and on some suburban lines and are exceptionally good on double-truck operations. The A plows are used on single-track suburban lines, but the side shear plows seem to give better service. We move the snow with the wings and leveling boards as far from the rail as possible, where it is picked up by either truck or tractor and removed further

regular salt car routes. The average consumption of salt per year per mile of track the past season, which was a fairly mild winter, was about 1 ton per mile of track.

We are called on to move snow in certain downtown city streets. During the past winter we cleaned 3 miles of streets at an approximate cost of \$2,500 per mile, the loading being done by hand, using teams and trucks to cart the snow away. At night we sometimes use a motor flat and trailer. We are unable to dump snow into our sewer manholes in Hartford, but outlets in several bridges allow us to dump snow into the Par River in the downtown section and also in the Connecticut River, where we dump with a very

short haul. In the case of snow trains as described above, the haul is considerably longer and at least 2 miles from the center of the city.

It is my belief that personal contact

with the crews and a word of encouragement from time to time when the storm is raging are very helpful. We try to impress on them the responsibility of keeping their routes open.

Snow-Fighting Equipment and Methods

E. L. LOCKMAN

Assistant Engineer Surface Lines, Boston Elevated Railway

HANDLING of snow in a progressive community has undergone a considerable change from what it was some years ago when a certain amount of snow was left on the ground for the accommodation of vehicles on runners.

By law the Boston Elevated Railway is obligated to remove snow from the track area only. If snow is removed from the track area only vehicles will use the car tracks, thus delaying the car service. We find it is not only necessary to remove snow from the track area but also alongside the tracks to provide a roadway for other vehicles.

As time is the essence of snow removal, successful snow fighting calls for prompt, speedy action and special equipment is required.

In 1920 the company purchased its first piece of snow-fighting equipment other than car plows. This was a Champion snow plow. In 1922-23 we purchased our first snow loader. Two weeks after its receipt we purchased a second. We have added to this equipment from time to time. A list of the snow-fighting equipment owned by the company and operated by the maintenance department, exclusive of car plows, is as follows:

9 Barber-Greene snow loaders, 6 caterpillar tractors (5-ton) with steel plows, 3 Fordson tractors, 2 Walter truck snow fighters, 6 Differential cars equipped with snow plows, 3 rail cars equipped with side plows, 32 Champion snow plows for 5-ton trucks.

This equipment has a value of \$112,888.

In addition the maintenance department operates 36 motor trucks varying from 7-ton of the Mack and White type to 1-ton Ford trucks. This equipment

is used in regular service during all seasons of the year and is available for snow work when required.

CAR PLOWS

The company has a total of 162 single- and double-truck car plows are sixteen sweepers of both single- and double-truck type. The cost of maintaining the car plow equipment during 1925 was as follows: Car plows, \$10,263.64; car sweepers, \$2,763.49.

The cost of maintaining the Barber-Greene snow loaders, of which we had five in 1925, was \$368.08.

From Feb. 5 to 24, inclusive in 1926 the following snow work was performed by the maintenance department equipment:

Cubic yards of snow removed.....	52,785	
Truck loads.....	7,038	
Number of trucks used.....	650	
Average cubic yards per load.....	7.5	
Average cost per cubic yard.....	\$0.4688	
Total cost.....		
Trucks.....	\$18,822.48	
Operators.....	1,435.34	
Men with snow loaders and at dumps.....	4,490.44	
	\$24,748.26	\$24,748.26
No. of locations worked at.....		84

The average cost per cubic yard of snow includes hire of trucks and labor.

For effective snow fighting we find that a special organization is required both for the transportation department and maintenance department. Every man in the maintenance department, including the engineering force, clerks, etc., is assigned a place and used if the conditions require. The responsibility of handling snow is divided between the transportation and maintenance

departments. The duties are responsibility of each department are well defined and understood.

The transportation department plows the car tracks and operates scrapers on the buses if necessary. The maintenance department operates all snow-fighting equipment exclusive of car plows and procures extra trucks from contractors for plowing bus routes, throwing back snow on car lines and for hauling snow; also extra trucks are provided and equipped for emergency and are stationed at several predetermined points on the system. These emergency trucks are equipped with blocks and falls, jacks and other tools for the purpose of removing stalled automobiles and other vehicles which break down on the car tracks. We found during the snow period of February, 1926, that this service was absolutely necessary in order that we might operate our car schedules.

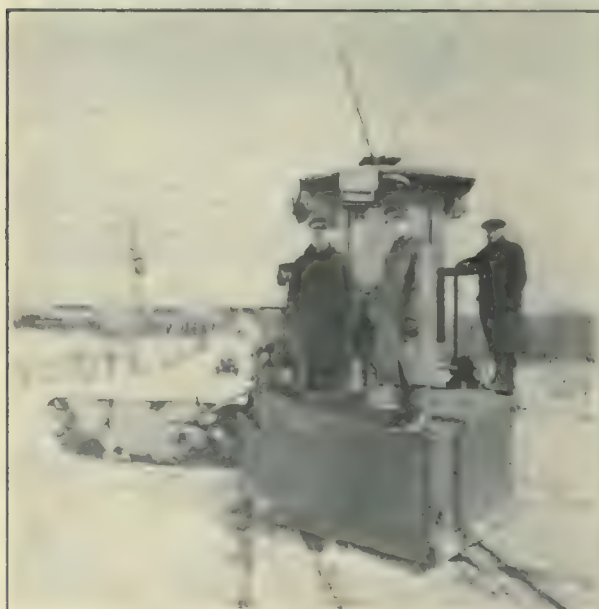
The maintenance department obtains permits for dumps for snow disposal. We have a total of about 60 sewer manhole locations for snow disposal and tidewater dumps located at various points in the system. We have a few land dumps, but land dumps are not desirable in connection with motor truck removal of snow.

To provide extra trucks necessary for snow fighting every fall we send out a questionnaire to local trucking concerns as to the number of trucks available and the price per hour, where located, etc., and during the season 1925-26 we had approximately 250 trucks on our list, available for snow work both for snow removal and for plowing.

During the past season we paid an average rate of \$27 per day of nine hours for hauling snow and \$36 per day of nine hours for plowing snow.

As before stated, we own 32 Champion snow plows for 5-ton trucks; 25 of these plows are used for hired trucks and seven for company trucks.

In addition to the car plow equipment we have found it desirable to equip certain service cars with side wings for throwing back the snow. We have three rail cars equipped with these



Eastern Massachusetts Equipment. At Left, Leveler with Nose Plow; at Right, Sweeper Rebuilt from Open Car

wings and six Differential steel cars equipped with front plows and we are now engaged in providing these steel cars with side wings similar to the side wings used with the rail cars.

During the heavy snow period of February the rail cars equipped with wings did wonderful work. No matter how deep the snow these cars had sufficient power to throw it back and provide a roadway of from 12 to 14 ft. wide alongside the car track for automobiles and other vehicles. Where streets were not of sufficient width to provide storage for this snow it was necessary to put out the snow loaders and remove it.

As to the relative advantages of equipment confined to rails and equipment not confined to rails, from our experience during the heavy storm of February, 1926, we found it would be necessary to have other apparatus than

field for the operation of our snow equipment; but if the storm is of considerable proportion and arrives during the afternoon the situation is seriously complicated.

Before the storm arrives the supervisory forces of the transportation and maintenance departments report to their particular districts to which they are assigned. Station masters, with sufficient assistants, report for the purpose of assigning and detailing plow crews. The maintenance department assigns men to cover special work, passenger landings, rapid transit lines stations and rapid transit interlockings.

When the snow is from 1 in. to 2 in. deep car plows are sent out. If the storm increases in intensity the plow routes are shortened and additional equipment put on as needed.

Motor trucks, properly ballasted and with front plows, are sent out by the

American Association News

Rolling Stock

REPORTS of chairmen of special committees in the rolling stock division outlining the work to be undertaken during the coming year occupied a two-day session of the standing committee on rolling stock held at association headquarters, New York, Dec. 13 and 14, 1926. Those present at the meeting were A. T. Clark, chairman; W. S. Adams, V. W. Berry, W. C. Bolt, W. W. Brown, R. S. Bull, R. W. Cost, F. J. Foote, M. R. Hanna, J. M. Hipple, E. A. Hutchins, J. S. McWhirter, T. H. Nicholl, Hugh Savage, R. B. Smyth, C. W. Squier and W. G. Stuck.

In a review of Manual sections special attention will be devoted to revising that for couplers and the location of end connections on interurban cars. Specifications for gears and pinions will be revised by special committee No. 10 on gearing. It was decided to recommend to the executive committee of the Engineering Association that special committees be formed to take up revision of standard journal boxes and the establishing of additional limits-of-wear standards.

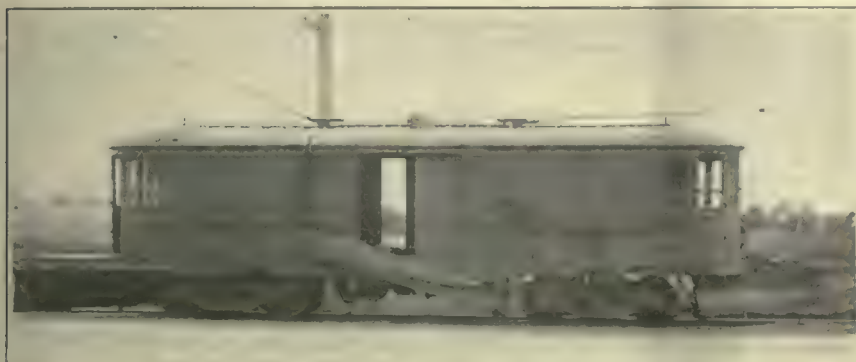
The committee that is studying motor coach design and maintenance methods will go over the specifications proposed by the Society of Automotive Engineers through its motor coach division for the New Jersey Board of Public Utility Commissioners, and it will also review the inspection schedules as published in the 1926 equipment committee's report.

In order to arouse interest in the subject of appearance, comfort and convenience of cars, a study of which is being made by special committee No. 3, a special campaign will be instituted. This will consist of a number of articles by men who are accomplishing particular improvements in the appearance, comfort or convenience of rolling stock on their properties, these articles to be published in *ELECTRIC RAILWAY JOURNAL*. Others will also be requested to submit letters for publication discussing the subject and outlining what they consider essential.

The study of car lighting being made by special committee No. 4 will include recommendations for the lighting of typical surface cars. Additional lighting tests will be conducted in order to secure data and a report on the number and sizes of lamps now available will be made, together with a list showing the demand for the various types in electric railway car service.

Discussion of results being obtained from roller bearings in European countries brought out that increased interest is being manifested and that the study being made by special committee No. 5 should prove valuable.

Committees which are studying side wear of brushes in ventilated motors, noise reduction in car operation and current collecting devices outlined the work which will be undertaken.



Former Eastern Massachusetts Express Car Equipped with Shear Plow

plows and sweepers running on car wheels. When lines become tied up due to stalled cars or other vehicles breaking down on the track, so do plows and sweepers, at which time it is advisable to have on hand some other form of equipment that can go around the block and clear the line ahead for the stalled cars. For this work we believe the Walter snow fighter will be a very effective piece of apparatus.

The Walter snow fighter is in effect a six-cylinder, 80-hp., 7-ton truck of four-wheel drive, equipped with snow scraper blade and front patrol plow, and while it is purchased for use on bus lines it may be used on the system wherever its services are required.

The company also has on hand six 5-ton tractors equipped with steel plows. These tractors are the most powerful snow-fighting outfits we have and their only drawback is their slow motion, but for pushing back an accumulation of snow we believe they are unexcelled.

On tracks and special work we use an average of 2,000 tons of salt per year. As the miles of surface lines operated total 310,408, this is an average consumption of approximately 6.4 tons per mile.

The salt is purchased in bulk and is received in steam railroad box cars at our freight yard and from there distributed by service cars to several points on the system. When occasion requires it is distributed by special salt cars and motor trucks.

If the storm arrives late at night or in the early morning hours it gives us no particular concern. We have a free

maintenance department as previously arranged to throw back snow from where it is deposited by the car plows and also to keep bus routes open. Other motor trucks equipped with jacks, blocks and falls, etc., and known as emergency trucks, are assigned to certain locations to assist the regular wrecking crew in removing broken down vehicles or vehicles that have become stalled on the car lines. Entrances to hospitals, public buildings, police stations, etc., are kept clear of snow.

About three hours after the storm is over, so abutters can clean their sidewalks the maintenance department sends out snow loaders to remove the snow from narrow streets and streets from which it has been agreed to remove one half the snow or from curb to curb. The amount of snow removed depends on the condition of the streets previous to the storm and the weather conditions following the storm.

During the night following the storm and as often as required service cars equipped with special side plows are sent out to throw back the snow toward the curbing. As before stated, this equipment has been found to be very efficient as it provides a roadway of from 12 ft. to 14 ft. in width from the car rail toward the curbs, and in this way we entice the automobile traffic to keep off the car tracks.

After every storm the snow equipment, of whatever type, is returned to its own station for inspection and repairs, if repairs are necessary, and there it is put in readiness for the next storm.

Professor Seligman Addresses Tax Committee

REGULAR and advisory members of the American Association taxation committee were addressed at a luncheon meeting held in the Engineers Club, New York, on Nov. 10, on the subject of the gross-net tax by Prof. E. R. A. Seligman of Columbia University, nationally known economist. Professor Seligman cited experience with this general form of taxation where it has been applied, and recommended it as a means of securing more equitable distribution of the tax load on business.

In discussing the taxation of utilities, and particularly the electric railways, he decried the unfairness of the burden now carried. He pointed out, however, that this was in large part attributable to unwise effort in the past to avoid a fair share of the tax burden. He held that no business could afford to dodge its fair share of taxes, but agreed that utilities are justified in striving to equalize their taxes with those carried by other forms of business.

During a morning session at association headquarters, and following Professor Seligman's talk, the committee discussed the advisability of undertaking a program to stimulate industry-wide advocacy of the gross-net system of taxation for electric railways. It was the purpose of the committee first to determine the sentiment of its own members regarding the principles of gross-net taxation and after that to undertake a study of the practical problems of its application.

There was some difference of opinion as to the advisability of an indorsement of the principle advanced or of advocacy by electric railways of any particular system of taxation. Such an indorsement was finally passed, however, with a number of members not voting. A sub-committee was appointed to make a further study of the gross-net method and to prepare a report on the subject for submission to the committee, and if approved to the executive committee.

Those present included the following; regular members, Chairman A. T. Davison, general counsel Third Avenue Railway, New York City; H. Allen, comptroller Chicago Surface Lines; Robert M. Feustel, president Indiana Service Corporation, Fort Wayne; H. L. Geisse, general manager Wisconsin Valley Electric Company, Wausan; W. A. Jackson, vice-president the Milwaukee Electric Railway & Light Company, L. R. Nash, operating vice-president Stone & Webster, Boston; C. L. S. Tingley, American Electric Power Company, Philadelphia; and W. J. Wright, assistant general counsel Public Service Corporation of New Jersey, representing Senator E. W. Wakelee. Advisory members at the meeting were W. J. Flickinger, Connecticut; A. W. Brady, Indiana; J. L. Swope representing C. D. Emmons, Baltimore; E. M. Walker, Schenectady; H. B. Cobban, Oklahoma; E. B. Griffiths representing A. W. Robinson; E. J. Dickson, Rhode Island; T. J. Moore, Virginia; Managing Director L. S. Storrs, J. W. Welsh, executive secretary, and Leslie Vickers, economist of the association staff.

city. We are perfectly willing to let them have business, but we don't want them to take our business away from us, because in the creation of this business we have made a huge investment in real estate and in building up good will. Decentralization would mean that the money we have spent for the good will and invested in our plant would be seriously jeopardized.

One of our neighbors tried the private parking proposition. A garage was hired and had two uniformed men to take the customers' automobiles from the store to the garage and bring them back again without any charge for the service or for the parking. But such is the selfishness of human nature, that the customers, realizing it would take a few minutes to get the automobiles, that they would be a little inconvenienced by this arrangement, refused to permit it, and the store finally gave it up in despair. Thus the much-heralded means of preventing parking around department stores by providing garage space, I am afraid, is doomed to failure. People simply will not do it.

At the present time there seems to be an insidious sort of propaganda, and I don't know where it comes from, that the street car is the source of all traffic evils, and the remedy proposed is the bus. I may not know much about it, but I think the remedy is a little worse than the evil. As has been said, the street cars stop on every corner, but I suppose the bus will have to stop somewhere too. The street car with its definite lane of travel carries about three times as many passengers as the bus, and it certainly is not causing the congestion that the bus is causing.

Buses are good things, but not good enough to supplant the surface cars. They are good things as auxiliaries to surface cars, but they should be in the hands of organizations skilled in transit. We have had some experience along that line. Once we tried to give some of our delivery to an unskilled organization. The result was chaos and we had to turn it all back to our own organization trained in that business. They soon straightened it out.

I don't believe that putting buses on the streets, particularly on the main thoroughfares, is going to help us very much. It certainly isn't going to help the Police Department very much in controlling traffic, nor the public very much, unless the buses are in the right hands.

I believe if all those interested in the traffic congestion problem will get together with the powers that be, the city fathers and so on, and work out a solution of this problem, they will find a way out. I hope so from a selfish point of view, because if they do not, eventually there is going to be decentralization of the mercantile business. It will have to branch out like the banks, establishing branches in every section of the city. That will not benefit the public, because it will increase the cost of merchandise, and the public is going to pay. From the point of view of a centralized merchant I feel that this traffic problem is so important that all the merchants are right in bending their best efforts and giving all the assistance possible to those interested in improving traffic conditions.

Parking No Aid to Merchants*

By F. C. Fox

Assistant to President A. I. Namm Company, Brooklyn, N. Y.

THE merchant today is seriously interested in the transportation problems. First, I think, I ought to indict the merchant as being guilty of producing a great part of the present traffic congestion. The downtown shopping district has become an institution. A number of large department stores have been established in one section. We spend millions of dollars annually to bring people to that section from all the outlying districts. We have created this vast movement and, having built up this tremendous congestion, now we are crying for help.

It is not quite right to say that the merchant is selfish and wants his customers to park around the store and in the streets adjoining the store, because he doesn't. We made a check recently to ascertain what benefit we received from the automobiles parked around our place of business. We front on Fulton Street, which, of course, is a two-track street. The rear is on Livingston Street which is likewise a two-track street. We found in the check-up that 75 per cent of our customers came to the district via subway or elevated, 24 per cent arrived by surface cars and 1 per cent presumably walked or came by automobile.

There were 118 automobiles parked

from 9 o'clock in the morning until 5 o'clock in the afternoon on Livingston and Hoyt Streets and Elm Place. From those 118 cars 80 customers came into the store, and just think what those 80 customers did to traffic on Livingston Street. They practically eliminated all of the road area except that section of it on which the surface cars were operating, so that these 118 automobiles impeded thousands of people.

We do not desire that condition and we are going to do our part to eliminate it. Congestion that we have helped to create is now undoubtedly seriously interfering with our business. It has become such a serious problem that when the Department of Commerce recently sent out a questionnaire to practically every merchant in so-called downtown shopping districts, these merchants agreed that this congestion is interfering with traffic so seriously that unless something is done the downtown shopping district will soon be a thing of the past.

We are not selfish; we believe in living and letting live, but we are alarmed to see the number of neighborhood stores springing up. A few years ago the grocers, the butchers, and the like were practically the only neighborhood stores. Now, because of traffic difficulty, we find all sorts of shops, specialty shops, springing up in almost every residential neighborhood in the

*Abstract of a paper presented at a meeting of the Metropolitan Section A.E.R.A., New York, N. Y., Dec. 3.

The News of the Industry

Merger of East Bay Transit Facilities

Key System Transit Company and Southern Pacific Likely to Merge Lines in Interest of Economy and Efficiency

Important changes in East Bay electric railway and ferry service are forecast by the announcement that the Southern Pacific and the Key System Transit Company, Oakland, Cal., are about to merge all or part of their lines in the interest of economy and efficiency.

Close on the heels of this revelation comes the statement that the Western Pacific is negotiating for the purchase of the Sacramento Short Line and that the stockholders of the latter road are about to vote on this question.

Students of railroad affairs see in these announcements a new development in the contest waged for some time between the Southern Pacific and the Hill interests. The latter are seeking a "place in the sun"; in other words, a new Pacific Coast terminal.

An ideal terminal exists in the East Bay, where the Key mole is located, just a little way up the bay from the Southern Pacific mole. The Hill interests are known to have "flirted" with the Key officials over its prospective purchase. But the Key officials have been wary. Their ferry and electric train service are the best paying portions of their holdings.

To complicate the situation, the Key lines have an agreement with the Short Line by which the latter is permitted to run its trains through the streets of the East Bay and to the mole. If the Western Pacific, through its adjunct, the Sacramento Northern, an electric road, should acquire the Short Line, it would also purchase the right to use the Key mole.

The Western Pacific has a terminal in Oakland, but it seeks a shorter route to the north than it now has. Its auxiliary, the Sacramento Northern, runs between Chico and Sacramento. In the event of the purchase being approved by the stockholders of the Short Line, it is said that the Hill lines, the Northern Pacific and the Great Northern, through their subsidiary, the Oregon Trunk Line, would build a link from Klamath Falls in Oregon to Chico and then run trains over the Short Line tracks to the Key mole.

Officials of all the roads concerned have admitted that the negotiations are in progress and that there is "something doing." Walter Arnstein, president of the Short Line, stated that the stockholders of his road will shortly vote on the matter of the pur-

chase and C. M. Levey, president of the Western Pacific, also admitted that the deal is under way.

Key officials are equally frank, but declare that at the present time plans are tentative. C. O. G. Miller for the Key System Transit Company asserted that surveys are in progress by engineers of the Southern Pacific to determine how some of the duplicate service of the two ferries and electric lines can be eliminated in the interest of efficiency and economy.

Regardless of what plan or plans are finally adopted, it is likely that the ferry schedules of the two lines will be alternated and that commutation books will be made interchangeable. This is a plan that has long been considered and one that will meet with popular favor.

Under another plan considered Key System trains will practically cease to run to Berkeley and East Oakland, those two sections being given over to Southern Pacific service almost

exclusively. In turn, it has been suggested that the Southern Pacific abandon its Central Oakland service in favor of the Key.

Mr. Miller also admitted that still another plan being considered is one that calls for a merger of the Key and Southern Pacific electric lines and ferries through the formation of a holding company, each line to keep its own operating head. Under such an arrangement, it is pointed out, great economies could be effected and a reduction in rates would probably follow.

It is expected that Paul Shoup, executive vice-president of the Southern Pacific, will have final say as to which of five plans is to be chosen. He has been in the East for some time.

Key officials declare that the recent raise in railway fares from 6 to 7 cents, which was expected to bring more revenue, has failed of its purpose and that no financial relief has been afforded.

Chicago Coach Hearings Start Dec. 21

Motor Interests That Would Supplant Street Cars Want Adequate Return—Say They Cannot Be Silenced by Arrogance—Backed by Big Bankers, Including Seligman and Guaranty Trust—One Side Says It Can't Be Done, Other Says It Can

JOHN A. RITCHIE, president of the Chicago Motor Coach Company, was the chief witness at the public hearing called on Dec. 10 by the committee on local transportation of the Chicago City Council to consider the proposal of his company, submitted to the Mayor and the Council on Dec. 8. This proposal, it will be recalled, contemplates that the motor coach company shall be permitted to take over the functions of the Chicago Surface Lines in supplying comprehensive city-wide transportation in Chicago after the expiration of the railway company's franchise next February.

The discussion on Dec. 10 was preliminary and really constituted the first of a series of hearings on the matter to begin Tuesday, Dec. 21. In this series of hearings it is expected that such points as cost of operation, compensation to the city, capital investment, flexibility of operation, relative speed, capacity of vehicles, existing litigation, economic use of street space, paving, etc., will be taken up.

ADEQUATE RETURN WANTED

At the preliminary hearing Mr. Ritchie outlined in general the company's plans. He said that as to the whole contract "the city can write its own ticket, so long as we are enabled to earn an adequate return." Little more than the barest essentials of the plan were touched upon, however, and

no definite action or results can be expected until after the investigating committee has delved into the matter thoroughly.

Mr. Ritchie's appearance before the committee drew a vast throng of city officials, Surface Lines executives and representatives of the trainmen's union. By way of preface Mr. Ritchie declared that his company's long experience and financial responsibility qualifies it to undertake this great enterprise. Among the bankers who have approved the plan and stand ready to finance it, he mentioned the Foreman Trust & Savings Bank, Chicago, and the Guaranty Trust Company and J. & W. Seligman Company, New York. The discussion at this meeting followed along much the same lines drawn in the letter originally addressed to the committee, but Mr. Ritchie was kept busy answering the questions and criticisms of the none too credulous Aldermen. He seemed undisturbed by the many queries and objections thrown at him by the Aldermen. At the close of the hearing, he conceded that if provision was made for a reasonable return on the investment, the city could write any kind of a franchise and "we will meet your terms."

MR. RICHARDSON ANSWERS MR. RITCHIE

Some of Mr. Ritchie's arguments in his original proposal were answered by Guy A. Richardson, vice-president of

the Chicago Surface Lines. He was quoted as follows in the Chicago *Tribune*:

The bus lines so far this year have fallen off 4 per cent in passengers, while the street cars have made an increase of more than 4 per cent. When the novelty wears off the public comes back to the street car the old trustworthy transit, rain or shine sleet or ice, hot or cold.

If buses are to give city-wide service certain things would have to be cared for first. Let me enumerate some of them: greater frequency of buses at ends of lines service at all hours of the day, a greatly increased ratio of rush service to non-rush reasonable head room, pneumatic tires, air brakes for safety, working conditions and wages, heating and ventilating, taxes and street charges for paving. Even the change to pneumatic tires, which would cost 1½ cents a bus-mile, would wipe out the present profit from operation.

If these factors were cared for, as they are by the street car lines, the fare by buses would be closer to 15 cents than 10 cents.

Mr. Richardson discussed the buses in London, which were used as an argument in the proposal of the Motor Coach Company. He is quoted:

Conditions in London and Chicago are not comparable. In London the tramway is the workman's vehicle. He gets a special rate at rush hours. So the buses do not start operating until 8 a.m. and they cut off service, except on main thoroughfares about 8 p.m.

The buses carry the great bulk of the London traffic. But the average ride in London is less than 1 mile, as compared with 4½ miles for the Chicago street cars. They keep hopping on and off in London.

If London buses carried their passengers as far as do the Chicago Surface Lines London would require three times as many buses as now. London's volume of traffic is on a different basis than there.

They have few private automobiles; traffic is mostly taxis, buses, and commercial vehicles. Tramways are excluded from the old city of London, which is about 12 square miles. The buildings are low, no skyscrapers, the people are more widely distributed, many of them walk to work. They are not centralized as here in the downtown district. Yet last year the London transportation committee curtailed the number of buses on account of the great congestion. So much for London.

Mr. Richardson discussed the Fifth Avenue buses of New York:

The Fifth Avenue Coach Company operates on the finest sightseeing street in the world, yet after 30 years and more as a company it has been able to justify using only about 300 buses in the largest city in the country.

The present speed of buses on Fifth Avenue is less than 4 m.p.h. all afternoon, and between 5:15 and 6:15 p.m., between 32d and 52d Streets it is only 2½ m.p.h., or less than a walking gait.

This is not transportation and should be forced off the street to let other fast vehicles have a place. Five subway trains per hour would handle more people than do the Fifth Avenue buses, and at 25 m.p.h. instead of 2½. Fancy taking 22 minutes regularly to travel a mile!

The bus company claims it could do the work of Chicago's 3,539 street cars with 4,685 buses. It would be impossible—the load is too high. It would take at least 6,500 buses at a minimum to serve Chicago if paving, street clearances, and so on were arranged so that they could operate.

The price bid by Yellow Coach for such a type bus for Detroit this year was \$12,125 without tires. So 6,500 buses at \$12,500 with tires would cost \$81,000,000. This would represent the investment in buses alone.

The present investment of the Chicago Motor Coach Company, in land, buildings, shops, garages, coaches and equipment necessary for present operation is about \$6,900,000. Coaches alone make up about \$3,700,000, or about 53 per cent of total necessary investment. The figures are from records on file with the Commerce Commission.

If this ratio holds good, and it should, the total investment needed for a system of 6,500 buses would be about \$150,000,000. If there are only 4,700 buses, the total would be at least \$110,000,000.

The bus proposal, interpreted by some to mean the wiping out of the entire capital investment of the Chicago

Surface Lines without return to the investors, has brought some rather severe criticism. The *Journal of Commerce* said editorially.

The street car lines which Mr. Hertz proposes to supplant are now giving Chicago the best surface transportation of any large city in the world. Of course there is overcrowding and there is straphanging, and some of the motormen and conductors are surly fellows. This, that and the other complaint is true. But the Chicago street car lines are not here being compared with limousines or parlor cars; they are being compared with street car lines in other large cities. And the Chicago street car service is better than that in any other large city.

An enormous number of people are carried at peak hours in the early morning and the late afternoon, and there has to be straphanging just as there has to be a busy signal on the telephone wires at peak hours. The street car public would lose much of its discontent if it could be frequently transported to other large cities in order to experience the service there at the rush hours.

That it would be possible to junk the great surface transportation plant and perform as good a service by buses, does not seem reasonable to the observer.

And yet if it be assumed that all that Mr. Hertz says is true, still there is a moral objection to the junking of the street car lines. There is a plea in equity for the people who have lent many millions of property to give Chicago the best street car system, and whose investment would be destroyed if street cars were abandoned.

Twenty years ago the street car franchises were given. It was then agreed that at the expiration of the franchises on Feb. 1, 1927, the city should have the right to buy the lines at a contract price. Fifty-five per cent of the net receipts was set aside for a traction fund, which would constitute a large part of the price the city would pay for the property.

The obligation now rests upon the city either to buy the property as agreed twenty years ago, or else to permit a continuation of service. Any other course would be an injustice to the investors who twenty years ago, and by means of purchase of bonds since then, have supplied capital which now should either be returned to them by means of city purchase of the lines, or which should be permitted to continue earning returns.

It is unlikely, however, that the moral obligation will be much considered by the City Council. It is one of the axioms of popular philosophy that an investor in a public utility is always a villain, and that every dollar that can be squeezed from him is a dollar laid upon the altar of righteousness. Therefore moral objections to the junking of the street car lines will not count. But practical objections count immensely. Aldermen will be wary about creating a situation in which people who want to go to their work cannot find a way to get there.

MR. RITCHIE ANSWERS MR. RICHARDSON

Officers of the motor coach company were quick to reply to these criticisms. Mr. Ritchie did so in a statement made public on Dec. 13. Another communication was dated Dec. 12. In addition still another statement was made in which some of the reasons were advanced why a city-wide motor coach system "could meet the existing requirements of surface transportation in Chicago better and more quickly than any other form of local service," but in the interest of brevity and avoidance of technicality, other important features were merely mentioned, leaving more detailed consideration to this further letter and "to conferences with your body."

In his statement of Dec. 12 Mr. Ritchie served notice "that we cannot be silenced by arrogance, glittering generalities, and misstatement any more than the people who are suffering because of lack of proper transportation can be silenced by such. The time has passed when deception can triumph." He felt a questioning attitude to be natural, proper and reasonable, but his

response to those who said that "it can't be done," namely, furnish a city-wide system to carry all of the passengers now being carried by the street cars, was: "We can do it."

These various communications in behalf of the bus company run to the extent of 24 closely typewritten pages. It is impossible to do more than indicate the scope and the tenor of these statements. Mr. Ritchie replied to several of Mr. Richardson's criticisms and then said that "there would seem to be no reason to analyze in detail the other statements made in the article referred to (the *Tribune* article). It is evident that Mr. Richardson was incorrectly reported or spoke without authoritative data, giving general impressions rather than readily ascertainable facts." At another point Mr. Ritchie said that "whatever opposition modern motor coach service meets is of the kind that was met by the printing press, weaving machinery, great beef-packing plants, elevated railroads, etc., and which always arises to oppose a better way of doing old jobs. Old established interests suffered, but society as a whole is entitled to the fruits of civilized progress."

The general communication, to which reference has been made, says:

A city-wide motor coach system such as we proposed in our letter could, better than any other type of street surface transportation, be co-ordinated with rapid transit lines in Chicago easily, quickly, and without impairment of capital, or the necessity of any large new investment. This can not be said of any other existing type of surface transportation.

The first official confirmation of the plan, to supplant local street car service by putting 4,200 additional buses on the streets of the city was evoked on Dec. 7, when John Hertz, chairman of the motor coach company, held a conference with Mayor William E. Dever for the purpose of obtaining a hearing before the local transportation committee. Representing that such a plan is not only possible but commercially feasible, a letter signed by Mr. Ritchie, president of the company, and seeking to "work out with the committee a complete plan of motor coach transportation for Chicago, which in our judgment, will result immediately in great public advantage," was accordingly laid before the local transportation committee the following day.

The letter of President Ritchie to William E. Dever, Mayor, and the City Council follows:

By reference to the volume published by Al. F. Gorman, city clerk, in November, 1924, entitled "Sundry Proposals and Plans for the Development of Local Transportation Facilities in the City of Chicago," it will be found that on Sept. 24, 1924, we called attention to the fact that the Chicago Motor Coach Company could serve the city of Chicago and its people with greatly improved transportation facilities.

Since that time we have given further study to the subject and are now in a position to work out with you a complete plan of motor coach transportation, which, in our judgment, will result immediately in great public advantage.

Notwithstanding the case now pending in the Supreme Court of Illinois between the city and our company, involving certain legal questions, and having in mind the importance to the city of Chicago of an early settlement of its surface transportation problem, and agreement can be entered into between us which will bring about a prompt solution of the problem. This agreement would be binding on the city and our company, no matter which side is successful in the pending litigation.

Brooklyn City Employees Receive Safety Bonus



Left to Right, N. R. Nay, James Prundy, William Preisendorfer, Borough President James J. Byrne, Everett Merrill, Michael Ford and John Walker

Approximately 86.4 per cent of the 2,172 motormen, conductors and safety car operators in the employ of the Brooklyn City Railroad participated in safety bonuses distributed on Dec. 15. This was in accordance with the new plan inaugurated by the company on Aug. 1 of the current year, under the terms of which platform employees receive \$5 for each 30 days of work completed without a chargeable accident.

Distribution of the bonuses was made at each of the carhouses with appropriate ceremonies, at which C. E. Morgan, vice-president and general manager of the company, and Borough President James J. Byrne of Brooklyn presided.

Failure to report any accident in which the company's cars may be involved is cause for loss of the bonus by the men responsible. In determining chargeable accidents under the

terms of the bonus plan, responsibility on the part of the crew is determined by the management after investigation.

Since the plan has been in operation for a period of only four months during the current year, the maximum bonus which could be earned by any employee was \$20. During a full year the maximum amount which can be earned is \$60. Nineteen of the 1,876 men participating this year received the maximum amount. Of the remainder, 747 men received awards for three 30-day periods, 727 for two periods and 383 for one.

Summarizing the results accomplished, Vice-President Morgan states that accidents of all types were decreased 35 per cent in the month of October from the total of the corresponding month in 1925 and that this rate of decrease is being maintained from month to month.

We propose giving Chicago a complete installation of modern double-deck motor coaches, serving not only the people now served by the Surface Lines, but extending the installation to localities at present without any service.

The motor coaches to be furnished would be of the most recent design, with the upper decks fully inclosed, so that the full seating capacity would be available at all times of the year under any weather conditions.

We propose to furnish a sufficient number of motor coaches so that during rush hours there would be available 290,000 seats as compared to 156,000 seats now provided by the Surface Lines.

In rush hours, because of increased schedules, approximately eight motor coach passengers out of every ten would have seats, compared with present conditions on street cars where approximately four passengers out of every ten have seats.

During non-rush hours, based on the same schedules as present street car operation, our service would furnish 40 per cent more seats than are now provided by the street car system.

Express or "limited stop" motor coach lines would be installed, furnishing quasi rapid transit service, thus saving large numbers of passengers an appreciable amount of time. This type of service is needed, yet it cannot be rendered by any street transportation agency operating on rails.

By reason of long experience and financial responsibility, we feel qualified to undertake this work, and, therefore, ask that full consideration be given this communication.

The modern large capacity motor coach is a more efficient carrier than the street car, due to the marked improvement in construction in recent years. There has been little progress in recent years in street railway systems; the mileage has failed to keep pace with transportation needs, and the present tendency is to avoid adding new mileage. The motor coach, on the other hand, is expanding and interest-

ing the best engineering, economic and financial thought of the country.

The art of motor coach design and construction has developed to the point where mass transportation can be adequately handled by the motor coach. The motor coach has already demonstrated in actual service in London its ability to handle large masses of people, notwithstanding that the type of motor coach used is less in carrying capacity than the type we propose to use.

In London, in 1925, an average number of 5,500 motor coaches, with an average seating capacity of 47 persons, carried 1,671,000,000 passengers, or more than were carried by any other facility in that city; more than were carried by all street car and motor coach systems in Chicago; more than were carried by the entire Interborough Rapid Transit Company's system of subways and elevated railroads in New York City; and nearly twice as many as were carried by all of the steam railroads of the United States together, as reported by the Interstate Commerce Commission. This is mass transportation!

For the proposed city-wide operation in Chicago, the fully-inclosed, double-deck coach will seat 62 passengers and will be designed to accommodate comfortably a small number of standing passengers on the lower deck. The question of increasing the carrying capacity of the motor coach for the accommodation of a reasonable number of standees is a simple engineering matter.

In Chicago the street cars have an average seating capacity of 44, and, in rush hours, carry more standing than seated passengers.

The Surface Lines in Chicago could not carry passengers at present cost except for the large standing loads.

On the proposed system, 134,000 more seats would be provided than are now available on the Surface Lines, with only a small standing load.

In the proposed motor coach system, approximately 80 per cent of the investment would go to provide motor coaches and 20 per cent for garages, repair shops and

working capital; while on the Surface Lines only 21 per cent of the investment is in street cars and approximately 79 per cent in other items, only a small part of which is for car barns and shops, the major portion being for track construction, overhead electric system, power plant equipment and other items not needed for motor coach operation.

The total capital investment for the proposed city-wide motor coach operation in Chicago would be less than one-half of the present value of the Chicago Surface Lines as reported by the Board of Supervising Engineers.

The length of the average ride per passenger on the Surface Lines in Chicago is about 4 miles. On the present motor coach system, operating largely on the boulevards, the average ride per passenger is about 6 miles.

The larger volume of business, the flow of traffic to and from the large number of business and industrial centers throughout the city, the large amount of two-way riding, the shorter average ride, together with other factors, all incidental to a city-wide operation, account materially for the difference in the present motor coach and street car fares.

Considering the lower investment and other elements as now existing making up the cost of carrying a passenger, with the advantages incident to a city-wide operation, the cost of carrying a passenger on the proposed city-wide motor coach installation would, under reasonable terms, be approximately the same as that on the Surface Lines.

The cost of street car operation per mile operated is 34.03 cents, and the cost of motor coach operation under our proposed plan would be 34.92 cents.

The trend of public thought in Chicago is toward co-ordination of all local transportation systems. There is also a public demand for additional rapid transit in order that a larger number of our people may enjoy its benefits. The proposed motor coach system lends itself to a co-ordination with rapid transit more readily than any other form of surface transportation.

We favor early co-ordination with rapid transit and stand ready at all times to co-operate to obtain it.

The flexibility in operation of the motor coach makes it possible to rearrange routes in such a way as to bring the people in contact with rapid transit without the delay and expense incident to reconstruction of surface lines.

Such readjustment by the motor coach can be made without impairment of, or increase in, invested capital, which cannot be said of any other transportation agency.

There are many factors which make motor coach transportation desirable in Chicago, touched upon generally in this letter, and which will be further elaborated in detail in personal conference with your transportation committee.

Less street congestion—the total street area covered by 3,539 street cars in operation is 1,443,912 sq. ft. and the total street area covered by 4,685 motor coaches in operation (the number proposed under our plan) would be 1,124,400 sq. ft., a saving in street area of 319,512 sq. ft., or 22 per cent.

No street car tracks, with the accompanying tearing up and laying down.

No trolley poles or overhead wires.

Motor coach service reflects the modern tendency for quality in matters of business and recreation. It provides safe, smooth, comfortable and healthful transportation.

The motor coach is readily adaptable, without material initial expense, to any development of Chicago's comprehensive plan of civic improvement.

No long construction period required. We estimate that a substantially complete service could be ready in six months.

We can install a complete system on the basis of a twenty-year term.

It is the most comfortable city transportation offered the public.

Faster movement through congested traffic.

The breaking down of a motor coach does not delay other motor coaches.

Wire and power house troubles are absent.

Disabled vehicles and other obstacles can be readily passed.

Deviation may be made from regular routes in case of fire, accident, parades, etc.

Fewer accidents, since coaches stop near the curb. The curbs stops make for greater safety, particularly in the transportation of children to and from schools and elsewhere.

Quieter operation.

Advantages to the city's popularity in showing visitors the city under the best transportation conditions.

Whenever it appears to the Illinois Commerce Commission—which, under existing law, has jurisdiction of our service—that

the public will be best served by the carrying out of our plan, we believe that its members will aid in such development and consummation.

The subject of fares, transfers, period of contract, capital investment, extension of routes, the right of the city to acquire, compensation to the city for the use of streets, and many other factors necessary to consider, are matters which have received our thought and attention. We are desirous of conferring with you to work out a plan which will meet with public favor.

Transit Survey in San Francisco

The city supervisors of San Francisco have adopted a motion appointing a joint committee of finance and public

utilities committee "to survey and study problems of transportation in this city and county, with particular consideration of early expiration of important street railway franchises, and report recommendations for acquisition of all privately owned street railway lines in operation here and efficient consolidation of such lines with the Municipal Railway." The resolution relates to the important Market Street Railway franchises which the city claims expire in two years and the company in four. The joint committee is empowered to appoint a citizens' advisory committee.

Seattle in Crisis

Taxpayers Who Maintain Interest in Municipal Railway See Affairs of Road Hopelessly Involved—Mayor Favors Refinancing and Would Buy More Cars

UPON request of S. B. Asia and the "fourteen taxpayers" who have maintained a lively interest in the affairs of the municipal railway at Seattle, Wash., City Comptroller H. W. Carroll has furnished data which Mr. Asia says show the lines to "have reached a crisis financially." Although \$4,236,500 has been paid on the bonded debt, accrued depreciation is estimated to total \$4,794,688. Mr. Asia also points out that the railway's financial dilemma is further aggravated by the fact that it went on a warrant basis on Dec. 10 to pile up funds to meet approximately \$1,150,000 in bond principal and interest due on March 1.

Mr. Asia further points out that the railway must reimburse the Puget Sound Power & Light Company to the extent of \$600,000 for taxes paid on railway property for the year 1919 and interest, together with court costs. He states this liability will increase the deficit from \$769,427, the amount now recorded, to more than \$1,300,000.

As for the accrued depreciation amounting to \$4,794,688, for which no sinking fund provision has been made, this is declared to mean that when the useful life of the plant is ended there will be no funds to replace it, because the laws of this state prohibit the issuance of bonds for replacement purposes. Mr. Asia said:

I maintain that it is the height of folly to assume that the railway is making good when the facts are that there is a large deficit, or excess in liabilities over assets in the railway fund, and that this deficit is increasing daily. While bond installments are being paid, working capital on hand is diminishing each year as the deficit grows, and no funds are being laid aside for replacement of plant.

MR. ASIA'S SEATTLE SUMMARY

Date	Deficit	Surplus
April 1, 1919 (5c. fare) ..	\$70,453. 82	
April 1 to Dec. 31, inc., 1919 (5c. fare) ..	507,425. 92	
Year 1920 (5c. and 6½c. fares) ..	1,236,283. 60	
Year 1921 (6½c. and 8½c. fares) ..		\$226,588. 29
Year 1912 (8½c. fare) ..		710,083. 95
Year 1923 (5c. and 8½c. fares) ..	107,868. 14	
Year 1924 (8½c. fare) ..		369,430. 78
Year 1925 (8½c. fare) ..		25,746. 01
Year 1926, first nine months (8½c. fare) ..	179,244. 67	
Net deficit September 30, 1926 ..	\$2,101,276. 15	\$1,331,849. 03
		769,427. 12
	\$2,101,276. 15	\$2,101,276. 15

On the other hand, Finance Chairman E. L. Blaine of the City Council, pointed out that on Dec. 31, 1920, the city railway fund had a deficit of \$2,100,537 brought over from Division A and growing out of the first 21 months of operation on an inadequate fare. Five years later, on Dec. 31, 1925, this deficit had been reduced to \$590,182, a total reduction of \$1,510,354, he states.

On Dec. 31, 1920, bonds to the amount of \$17,315,000 were outstanding. Five years later this had been reduced to \$14,299,500, a net reduction of \$2,915,500, despite the issuance of additional securities between these dates, Mr. Blaine claims. The actual payment on bonded indebtedness during this period was \$4,846,191.

In addition to the above decrease of \$1,510,354 in the deficit, according to Mr. Blaine, and the net reduction of \$2,915,500 in the capital investment, the system paid \$5,606,000 in interest, making a total payment of \$10,031,854 over and above all operating, maintenance and other overhead expenses. He said:

I submit that this is a pretty good showing for a business that is approaching bankruptcy. All this has been accomplished in spite of persistent attempts to discredit the system on the part of those agencies in the city which should be interested in building up rather than tearing down the industries of the city and whose very existence is dependent upon adequate transportation being furnished our citizens.

Just prior to the announcement by the Clearing House of Seattle that it would refuse to cash railway warrants, Mayor Bertha K. Landes issued a statement on the railway situation in which she made the following three recommendations:

1. The railway system should be re-financed.
2. Economies in operation should be adopted.
3. Revenues should be increased by improving service, principally by the purchase of 80 new street cars.

The Mayor added that she wished to confer with the chairmen of the finance and the utilities committees of the Council on refinancing of the lines. The Mayor was quoted as follows:

Increasing revenues are a very necessary factor in solving the problem of even reasonable financial stability for the system. The only way to increase revenues is by speeding service and creating more express routes for the outlying districts.

The way to do that is by buying the 80 new street cars. I feel like urging you to consummate this deal quickly if our interests can be quickly taken care of, bearing in mind that the proposed cars are a vital

part of the new program for successful operation of the railway.

On Dec. 10 the city of Seattle cashed the payroll warrants of more than 2,000 railway employees. Two days before the payrolls were due the Clearing House had refused to cash the municipal railway warrants. Finally, Mayor Bertha K. Landes and members of the City Council arranged for a loan of the necessary funds from the city light department. It was found that the city light department has on hand about \$1,200,000 in cash, and the water department fully half as much representing proceeds of bonds sold for construction work. By borrowing from the fund, it was pointed out, the railway is helped and the light department will profit, for the railway warrants bear 6 per cent interest. Before this plan was made public, the Mayor received an offer from Rhodes' department store to cash the \$130,000 of railway warrants.

In a belated effort to meet the emergency, members of the City Council advanced two proposed plans for refinancing the railway. Of the two refinancing plans favored, one is to induce the Stone & Webster interests, from whom the railway was taken over, to grant an extension of time on the railway purchase bonds; the other is to issue long-term refunding bonds sufficient to pay off the present bonds. At the present time the city pays \$833,000, annually on the principal. This sum with interest brings the payment to approximately \$1,500,000. If the bondholders are willing to grant an extension of time, to permit a payment of not more than \$500,000 annually, E. L. Blaine, chairman of the City Council finance committee, states the line could be made to pay.

If the refunding plan is attempted, the city must first go to the Legislature for authority to float such an issue. The city owes approximately \$10,835,000 on the \$15,000,000 purchase. It would be necessary, therefore, to issue \$10,835,000 in refunding bonds to pay off the present outstanding bonds. The refunding bonds, so Mr. Blaine pointed out, would be on a 50-year basis.

LEGISLATIVE AUTHORITY NECESSARY

In the meantime the Council expects to adopt suggestions of D. W. Henderson, superintendent of the railway, that will further reduce operating expenses. The changes affect nearly every car line in the city and will result in an estimated annual saving of \$300,000 in operating costs. The plan contemplates speeding up of service by rerouting lines through the downtown district to reduce congestion. The basic idea is to make street car riding more attractive by more frequent service, chiefly through the operation of loop cars during the early morning and late afternoon rush periods. Except in one or two minor instances, no curtailment of service is proposed. Unlike the plan proposed by Clark R. Jackson, superintendent of the public utilities department, Mr. Henderson's program does not call for looping back of all North End and Capitol Hill car lines at Pike Street. Mr. Henderson estimates that the saving in operating costs due to rerouting will be \$156,364 a year, without any reduction in regular service.

Increased Rates in Petersburg Sought—Buses to Operate

The Virginia Electric & Power Company recently filed a petition with the State Corporation Commission for a general increase in transportation rates in the city of Petersburg, Va. The case has been set for a hearing on Dec. 21. It is stated in the petition that the company is planning to start the operation of buses in Petersburg on Jan. 1, 1927, in connection with its railway system. The company asks that the following fares become effective on that date over its railway and bus system in the Petersburg division: Cash fare, 7 cents; tokens, four for 25 cents; school tickets, 3½ cents. There will be no charge for transfers. Rates in force at present are: Cash fare, 6 cents; tokens, five for 25 cents, and school tickets, 2½ cents.

The company further declares that it plans to operate buses under an ordinance passed by the Petersburg City Council on Nov. 16 containing regulations for bus operation in that city. It also plans to replace railless cars on Sycamore Street with buses.

More Pay for Employees, Says Paper

The San Francisco *Chronicle* of recent date stated that the finance committee of the Board of Supervisors paved the way for an increase of 40 cents a day for clerks, car repairers, trackmen and janitors employed by the San Francisco Municipal Railways, San Francisco, Cal. This was accomplished by transferring \$50,000 from the 1926-1927 budget to reimburse the city lines for funds borrowed to aid in constructing the Twin Peaks and Stockton Street tunnels. Chairman McSheehy pointed out that all of the \$50,000 would not be used in meeting the proposed pay increases, but would guarantee the road against a deficit. Wages now received by the employees are as follows: Clerks, \$185 a month; trackmen, \$5.40 a day; car repairers, \$6.40, and janitors, \$145 a month. Several hundred will be affected by this change.

No Accident Bonus Plan Announced in New Jersey

As an additional incentive to careful driving on the part of car and bus operators, the Public Service Railway and the Public Service Transportation Company, Newark, N. J., on Dec. 3 put into effect a "No Accident Bonus Plan."

Under the plan \$1 will be credited to each operator for every week of the fiscal year in which his accident record is "clear"; that is, in which no accidents are charged against him. The first bonus will be paid him in a lump sum on or about Dec. 15, 1927, and each year thereafter, so that it will provide a welcome Christmas fund. If the operator's record is clear for the entire fiscal year he will receive \$60 instead of the \$52, to which he would be entitled under the letter of the offer.

A continuing record for each reporting operator will be kept in every carhouse and garage from which cars and buses are operated. Especially con-

structed blackboards will be used for this purpose. They will carry the name of every operator reporting at that particular carhouse or garage. For every week of the current month in which he has had no accident a white star will be placed opposite the operator's name and a red dot, red to indicate danger, for every week in which one or more accidents are charged against him. A cumulative record of white stars, red dots and bonus earned will also be kept for every man.

In addition, at the expiration of the year, the name of every operator who has gone through the twelve months with no accidents will be permanently painted on the board, the list constituting the house or garage honor roll.

"L" Rent Put at \$900,000

The proceedings before the Pennsylvania Public Service Commission on Dec. 10 on the matter of an "L" rental were adjourned by Commissioner Benn. Counsel for the Philadelphia Rapid Transit Company and protesting parties were instructed to file briefs and prepare to argue the case not later than February, 1927.

The outstanding testimony of the hearing was that of ex-Service Commissioner Scattergood, who stated that the Philadelphia Rapid Transit Company could operate the city-built Frankford elevated line at a substantial profit and still pay the city a flat rental of \$900,000 a year during the 30-year term of the proposed lease. He based his analysis of the earning capacity of the Frankford road upon figures submitted by the company. He said that proper consideration of the increased earnings through short-haul traffic on surface lines in the northeast section, due to the elevated operation, would establish the city's line as a consistently profitable utility.

Coleman J. Joyce, chief of the Rapid Transit Company counsel, objected to Mr. Scattergood's testifying as an expert, but was overruled by Mr. Benn, who said that the witness was as fully conversant with utility matters as any man on the bench. At the conclusion of the hearing, the commission instructed W. K. Myers, president of the railway, to forward his estimates of the rentals due the city each year in the proposed lease. That exhibit, which the Philadelphia Rapid Transit Company officials declared would differ materially from the figures submitted by City Comptroller Hadley, will be open to rebuttal by the protesting parties.

Pittsburgh Trainmen Receive Increase of 1½ Cents an Hour

At its regular meeting on Dec. 7, the Pittsburgh Traction Conference Board approved the item in the Pittsburgh Railways budget for 1927 which included the increase of 1½ cents an hour in the rate of pay of trainmen, effective Jan. 1, 1927. The contract with the men does not expire until May 1, 1928. As was stated in the *ELECTRIC RAILWAY JOURNAL* of Dec. 11, page 1062, the increase is considered economically sound because of the many economies the men have instituted or helped to put into effect.

New Rates in Knoxville

The Tennessee Public Utilities Commission has approved a new schedule of rates on the lines of the Knoxville Power & Light Company, Knoxville, Tenn., effective Jan. 1. It provides for selling six tokens for 30 cents, a weekly pass good for any number of rides for \$1.25 or 10 cents a ride for all who do not have tokens or passes.

Another Move in Jacksonville Franchise Issue

A tentative franchise for the Jacksonville Traction Company, Jacksonville, Fla., is to be prepared and submitted to the laws and rules committee of the City Council and the citizens' committee, from which a new bill of privilege is expected to be procured. This decision was made at a joint meeting of the two committees held in the City Hall on Nov. 30. A series of meetings is to be held, in which J. P. Ingle, manager of the company, will participate. It was his belief that the franchise, after it is prepared, should be submitted to the voters to decide. He announced that the company plans to spend \$750,000 on extensions and improvements to the service if a proper franchise is granted by the city.

Radial Agreement Submitted

The draft agreement between Toronto and the Ontario Hydro Commission for the transfer to the former of the Hydro radials was submitted to the board of control by the City Solicitor on Dec. 1. Objection was taken by the board to one clause providing that any property of the Toronto & York Radial Railway, which is not being transferred by the agreement, be still in the name of the Toronto & York Radial Railway. The city will deliver to the commission such conveyances, transfers and bills of sale as may be necessary to vest in the commission all property not being transferred by the agreement and which shall then be in the name of the Toronto & York Radial Railway.

It was suggested that the foregoing clause be taken up with the commission to have the agreement before the City Council with the agreement transferring the property to the Toronto Transportation Commission.

The agreement states the original purchase price and the amount spent in rehabilitation of \$2,375,000 and \$1,200,000, respectively, but leaves blank the further amounts to be paid by the city. The commission will secure cancellation of the \$1,200,000 bonds issued by that body, the city taking over the liability and leaving, finally, only \$2,375,000 bonds for the purchase, issued by the commission for the redemption of which the city will be responsible. The commission will hold the city's bonds to this latter amount as security for payment. The commission will continue to supply power at rates charged to similar enterprises with an indemnification of the city against loss. A complete transfer is provided for and a single arbitrator will adjudicate on any disputes arising in the future.

Philadelphia Rapid Transit Within Its Rights

Much has been said in the newspapers of Philadelphia in the last ten days about the inadequacy of the service furnished by the Philadelphia Rapid Transit Company on its surface lines. One of the charges is that a deliberate effort is being made to promote the use of the more costly cabs at the expense of the trolley service. In consequence the *Ledger* has reminded its readers:

In all consideration and discussion of transit service at this time of peak loads, due allowance must be made for the difficulties the company encounters during bad weather. It is admittedly hard to maintain schedules when ice and snow block the tracks.

It must also be remembered that the traction company is within its rights in urging the use of its cabs. It is not within its rights if it is promoting the use of its taxicabs by curtailing car service at the expense of the regular car riders.

The P. R. T. protests that this charge is both unfair and unfounded. Nevertheless, thousands of Philadelphians have the impression that it is true. It has been made for weeks by city and suburban car users. It should be the first business of the P. R. T. to eradicate that impression.

Traffic Jams May Require Rerouting

Rerouting cars of the Birmingham Electric Company as a means of eliminating congestion in the down-town district may become necessary in Birmingham, Ala., according to Ross W. Harris, traffic expert in charge of Birmingham's traffic survey. As a result of the recent rapid growth of the city the down-town streets are very badly congested. Mr. Harris will require a number of months in completing his survey and will then offer a solution.

Modified Franchise Recommended in Kansas City

The special franchise committee of the City Council of Kansas City, Mo., at a meeting held on Dec. 11, recommended a modified franchise, providing an income of \$2,000,000, based on 8 per cent earnings on a valuation of \$25,000,000. The modified franchise recommendation will be submitted to the Council immediately, although action probably will not be taken before Dec. 20. William G. Woolfolk, president of the new company, agreed in principle with the report, and representatives of the railway will act with the committee when a committee is chosen later to work on the actual draft of the franchise document.

The recommended franchise, which is for 30 years, provides that when the earnings of the company exceed 8 per cent, reductions are to be made in the ticket fare at the rate of a cent for each \$100,000 gain in the net annual income. The fare at present is fifteen tickets for \$1. An expenditure program of \$6,600,000 is required, half in rehabilitation and half in new improvements and extension. An 8 per cent return will be allowed on the money spent for improvements.

It is recommended that the street railways in both Kansas Cities shall be operated as one system, including uniform and universal fares and transfers. The city will have two members on the company's board of directors instead

of five, one of whom will be the city railway commissioner, who will have the power to determine what part of the expenditure shall be classified as repairs and what as improvements.

It has been pointed out by lawyers in Kansas City, Mo., that the proposed franchise is really not binding but is a "gentlemen's agreement," the Missouri Public Service Commission having the final control.

News Notes

Answers Filed in Fare Action.—

Counsel representing the cities of Niagara Falls and North Tonawanda and the village of LaSalle has answered the equity action brought in the United States District Court at Buffalo by the International Railway, Buffalo, N. Y., seeking to restrain the municipalities through which it operates local and interurban lines from interfering with the collection of a proposed new tariff of higher fares. The action also names the New York Public Service Commission as one of the co-defendants. The three municipalities which have replied to the equity action deny the present rates are confiscatory. They also say the federal courts have no jurisdiction and that the fare question rests with the Public Service Commission.

Hears Fare Petitions.—Commissioner Van Voorhis of the Public Service Commission conducted a hearing on Dec. 15 on the petitions of the Black River Traction Company and its subsidiary, the Watertown Transportation Company for permission to increase fares in Watertown and to discontinue the sale of round-trip tickets between Watertown and Glen Park for 15 cents. Evidence was presented showing a loss of \$12,996 in the operation of the traction company in 1925 and a profit of but \$588 in bus operation and that about the same result was expected in 1926. The city of Watertown waived the fare restriction of the franchises granted these companies and on March 21, 1921, permitted a 7-cent fare. On March 15, 1926, application was made for an increase to 10 cents or seven tickets for 50 cents, which was granted Oct. 18, 1926, subject to the approval of the commission. There was no opposition to these petitions.

Campaign Urges Patrons to Buy Tickets.—The Georgia Railway & Power Company, Atlanta, Ga., is making a drive to induce patrons to buy tickets by the week. Through different advertising mediums it urges the purchase of a "dollar's worth" of convenience. Patrons are urged to hand the conductor a dollar bill and get fifteen car tickets in exchange, or, better still, to buy a week's supply from the street conductor or at any of Jacob's stores before boarding the car. In other advertising matter the company says: "Buy your week's supply of tickets and forget about fares for the rest of the week. It's budgeting street car expenses just like you budget the rest of the items in your daily life." It is hoped that this campaign on the

"dollar's worth" tickets will result in material increases in sales.

Would End Skip-Stop System.—An effort is being made to have the City Council of Baltimore, Md., take part in a campaign being waged by some organizations and individuals to end the skip-stop system that has been placed in operation during the morning and evening rush hours by the United Railways & Electric Company. One of the members of the Council has introduced a resolution which requests the Maryland Public Service Commission to order the railway to discontinue this plan of operation. The resolution makes the claim that the skip-stop is "a great inconvenience to the general public and has done little to speed up traffic."

Wage Agreement Effected.—The Montreal & Southern Counties Railway, Montreal, Que., has concluded an agreement with its trainmen for three years, effective as from Sept. 1. Trainmen in passenger, baggage, express and work car service will receive 45 cents an hour for the first year; 49 cents for the second year; 50 cents for the third year and 52 cents for the fourth year. Conductors and motor-men in freight and snow plow service will receive 50 cents for the first year; 52 cents for the second year; 54 cents for the third year and 55 cents for the fourth year. The rates were recommended in the majority report of the board of conciliation and investigation appointed to consider the dispute between the management and employees.

Elimination of "Death Crossing" Expected.—The elimination of "Death Crossing" on the Illinois Traction System west of Edwardsville, Ill., where eleven persons have lost their lives during the past four years, was brought a step nearer when a jury in the Madison County Court fixed an award of \$1,500 as the amount to be paid the Tetherington estate for land needed by the Illinois Division of Highways to construct the southern approach to a viaduct to eliminate the grade crossing.

Higher Fares Increase Receipts.—Cash fares received on the Municipal Railways of St. Petersburg, Fla., on the first day of operation under the 7-cent rate showed an increase of approximately \$240 over those on the last day of the 5-cent limit. No definite comparisons could be made, it was stated, until the 12,000 tokens sold at the old rate and now being used by patrons were returned. The total receipts of the municipal railways on the first day of the month, when the 7-cent fare went into effect were \$1,070 in cash fares; \$67 in token sales; \$118 in school children's tickets and \$175 in cash fares on the buses, in addition to transportation of 65 passengers on tokens and 204 school children.

Greetings and Party in New Brighton.—The Beaver Valley Traction Company is giving its Sixteenth Annual Christmas Party on Tuesday, Dec. 21, at Junction Park, New Brighton, Pa. On a Yuletide greeting card, the invitation is forwarded for a good time to be had from 7:30 to 1. A Christmas party in New Brighton is part of the tradition of the company.

Recent Bus Developments

Fare Readjustment Sought

New Jersey Company \$1,600,000 Behind on Operation of Bus Subsidiary—Seeks Traffic Changes

Readjustment of fare zone limits on ten bus lines, five in Newark, calling for an additional fare where a city line is crossed, and a fare zone change on the Bloomfield trolley line are provided in a schedule filed on Dec. 15 by the Public Service Railway and Public Service Transportation Company, Newark, N. J., with the Board of Public Utility Commissioners to become effective on Jan. 1.

PRESIDENT McCARTER STATES THE CASE

The petition is signed for both companies by Thomas N. McCarter, president. It declares that "the problem to be decided by the board representing the public and the companies is whether fares should be immediately increased sufficiently to make these properties self-supporting, or whether other measures should and will be undertaken either to make a fare increase unnecessary or to lessen the amount of any necessary increase in fare."

The readjustment of zones, with the attendant increase in fares to a considerable number of riders, is only one of several measures suggested by the companies for eliminating the financial troubles connected with the operation of the transportation system in the various sections of the State. These included a further and more completely co-ordinated service; relieving the company of paving obligations; relief from charges for snow removal, street sprinkling and oiling; better regulation of traffic; institution of a better type of bus service; a reduction of taxes.

Five of the lines are in Newark and five outside the city. On the Newark routes a 5-cent fare has been charged, regardless of the fact that the end of the line was beyond the city limits. Under the proposed rate a 5-cent fare would be collected from passengers riding to the city limits and an additional 5-cent fare from all those riding beyond. Other lines affected similarly are those between Elizabeth and Roselle and between Paterson and Hawthorne. On lines between North Newark and Passaic and between Elizabeth and Kenilworth the fare for through passengers would be increased from 10 to 15 cents.

RAILWAY TAX COLLECTOR FOR PUBLIC

A statement made by the companies says in part:

In New Jersey the railways are practically tax collectors for the public, the riders on the car paying the taxes. These companies pay a franchise tax of 5 per cent of their gross receipts. In addition, they pay local taxes on real estate and personal property, the railway paying a gross receipts tax at the average state rate in lieu of its tax on personal property. These, of course, are in addition to federal taxes. Such high taxes are not assessed against any business in the country other than utility companies. These two com-

panies are paying taxes amounting to approximately \$2,740,000 a year.

All passes and reduced rate tickets of every kind and description should be abolished. If the rates charged permitted the companies to earn the full cost of service, passes and reduced rate tickets might be favored on the ground of public policy. But while these companies are attempting to maintain the 5-cent fare, which experience has shown to be too low a fare to provide the full cost of the service, losses should not be increased by carrying a certain class of passengers at a still lower rate of fare or for nothing.

All the above measures are in the public interest but cannot be made effective without the assistance and co-operation of the public authorities. They must be effective before the public can obtain the benefit of a completely co-ordinated and unified system of local transportation. Their adoption furnishes the only hope of supplying the public proper and adequate service at the lowest rates of fare consistent with such service.

When the railway instituted the 5-cent fare experiment at the request of the board, the company had filed a 10-cent rate. A higher fare than at present obtains is justified by experience, not only here but generally throughout the United States. The fare on buses in New York City and Philadelphia is 10 cents. The railway fare in most other places throughout the country is higher than that charged by this company, the average throughout the country being 7.7 cents. In New York City where the fare is 5 cents, a substantial part of the cost of operation is provided through general taxation.

Attention is then called to the fact that since the inauguration of the 5-cent fare the railway has failed to pay operating expenses and fixed charges with no return upon the money invested in the railway company by Public Service Corporation of New Jersey, and that Public Service Transportation Company has failed to earn operating expenses and fixed charges during this same period by more than \$1,600,000. "Neither the board nor the public can expect this state of affairs to continue," declares the petition.

Ordinance Would Protect Louisville Railway

A direct result of the announcement on Dec. 6 of the plans of the Peoples Transit Company to establish a bus line on Broadway, Louisville, Ky., in competition with the Louisville Railway has been the introduction of a regulatory ordinance before the City Council. This measure would bar buses and jitneys from streets containing car lines, or streets paralleling car lines for a distance of three blocks to each side, thus giving the traction company protection along its own line and closing adjoining property served by the line. The proposed new ordinance would also place restrictions on bus companies, regarding the amount of insurance, bond or similar protection that would have to be given the public, as protection against personal injury and property damage.

No action is expected on the ordinance until the latter part of the month. In the meantime it is understood that the new bus company is getting ready to start service directly. The new line is to use Mack buses, at least on its first unit installations.

Twin City Operation Explained

President Lowry Tells the Story of Co-ordinated Service Before Local Real Estate Board

Street cars will never be superseded by bus lines, says Horace Lowry, president of the Twin City Rapid Transit Company. He was speaking before the Minneapolis Real Estate Board, Minneapolis, Minn., on Dec. 9 in the first official review of the operation of railway and bus lines by the Minneapolis Street Railway and the Twin City Motor Bus Company. This last-mentioned company, an auxiliary, has two crosstown bus lines connecting intersecting trolley lines on Lowry Avenue and 38th Street and a gas-electric bus line supplementing trolley service on Nicollet and Hennepin Avenues.

Mr. Lowry said that the present rate of railway fares in the city yields just about the 7½ per cent return authorized by the Minnesota Railroad and Warehouse Commission. These rates of fare, 8 cents cash and six tokens for 40 cents, amount to an increase of 13 per cent over the old rate, which was 6 cents flat. On the other hand, passenger traffic has decreased 8 per cent, but fewer automobiles are entering the heart of the city than a year ago.

The bus lines have been operating only a few weeks. The gas-electric line does not compete with the railway. It is showing a profit at a 10-cent fare. Receipts of the crosstown bus lines, run at the same fare as the trolleys with transfers, are not yet up to operation cost. The gas-electric line, without transfers, is taking in about 38 cents a bus-mile on an operating cost of about 25 cents. The crosstown lines are operating at about the same cost, the Lowry Avenue line returning 13.1 cents a bus-mile and the 38th Street line 20 cents. In Minneapolis the street cars bulk about 18 per cent of the vehicular traffic but carry 76 per cent of the travelers.

In prospect for 1927 is a line across the new Ford bridge connecting the two cities over the Mississippi River and two car lines now reaching to the bridge in either city. Eventually there will be another crosstown line on 42nd Street, the farthest south now being Lake Street.

Proposed bus service for what is known as the Bryn Mawr line extension into a part of the city now being developed seems remote as the park board desires to collect a fee for the use of the parkways to compensate for the additional burden on the roadways from operation of buses. Mr. Lowry said this had been found impractical by the state commission as it would permit any town to levy taxes on buses passing through and would upset the entire state rate structure in the present system of state licensing of buses.

Bus Lines Authorized.—The Public Service Commission granted a certificate on Dec. 14 for the operation of bus lines in the city of Rochester and the town of Gates, Monroe County, to the Rochester Railways Co-ordinated Bus Lines, Inc.

Another Bus Proposal for Buffalo

Ernest M. Howe of Detroit, whose 5-cent bus plan in Buffalo collapsed last spring, has outlined to Mayor Frank X. Schwab a proposal for the operation of a fleet of 25 buses in Buffalo over three lines at an 8-cent fare. In his statement giving publicity to the new Howe bus proposal, Mayor Frank X. Schwab of Buffalo said that the American Car & Foundry Company had notified him that it would finance the new bus lines in Buffalo for Howe and his associates, who will operate under the name of the Buffalo Bus Corporation.

Sufficient capital to start the operation of 25 buses on three lines in Buffalo has been secured and Mr. Howe and his associates have indicated their willingness to post a bond of \$25,000 to insure the city that they will carry out every detail of the new plan to operate buses in competition with the local lines of the International Bus Corporation, a subsidiary of the International Railway, both of which are under Mitten Management of Philadelphia.

Application will be made to the City Council by Mr. Howe and his associates for a franchise on the three proposed lines and then the application will be taken before the Public Service Commission for the necessary approval. One of the largest makers of buses, it was stated by Mayor Schwab, will lend its financial support to the Howe plan and will appear before the state utilities board in support of the 8-cent bus lines. The International Bus Corporation charges a 10-cent fare on its three local lines in Buffalo.

Bus Plans for Suburban New York Maturing

The County Transportation Company, Inc., Port Chester, N. Y., petitioned the Public Service Commission on Dec. 10 for a certificate for the operation of bus lines in the village of Port Chester and the town of Rye, Westchester County. The routes indicated are from Liberty Square to North Main Street, Putnam Avenue, North Regent Street, Irving Avenue, Breckenridge Avenue, Fairview Avenue, Monroe Place and Westchester Avenue, returning to Liberty Square and also from Liberty Square to Westchester Avenue, South Regent Street, Boston Post Road and South Main Street to Liberty Square.

Negotiations have been under way for some time between the trustees of the village of Port Chester and the railroad as to the operation of railway and bus lines and public hearings were held on Nov. 1, 9 and 15. As a result the board of trustees adopted a resolution on Nov. 15 consenting to the abandonment of railway lines and the substitution of buses therefore. The resolution provides in addition for an annual payment to the village of 3 per cent of the gross receipts of the entire routes, that operations will begin within 60 days after a certificate has been granted; that present equipment is to be removed from the streets; that the fares will never exceed 10 cents with transfer privileges, and that the franchise will be for ten years from the

date of certificate issued by the Public Service Commission.

The County Transportation Company, Inc., also filed a petition with the commission for authority to issue 250 shares of its capital stock of the aggregate par value of \$25,000 and petition was also made by the New York & Stamford Railway for authority to purchase the Transportation Company stock and to pledge it as collateral security. Hearings will be held on the three petitions.

Transfers with Railway Suggested in St. Louis

The People's Motorbus Company of St. Louis, Mo., through its attorney, Robert Burkham, on Dec. 2, offered to work out with the United Railways a plan for interchange of transfers from the Kingshighway route of the bus company to and from the various street car lines connecting with it. The offer was made at a meeting of the rapid transit committee of the Board of Aldermen. It meets a suggestion contained in the Rapid Transit Survey recently made public by E. R. Kinsey, president of the Board of Public Service, and C. E. Smith, consulting engineer for St. Louis. Mr. Smith, who favors co-ordination of bus and street car service, declared the suggestion if adopted would be "one of the most important events in the transportation history of St. Louis."

Col. Albert T. Perkins, general manager of the United Railways, has declined to comment on the suggestion until he has had an opportunity to study it. The United Railways is in receivership and under the rules of the federal court, which has jurisdiction, the receiver is not permitted to accept less than the regular fare fixed by the Missouri Public Service Commission. The present car fare is 7 cents, while the bus company charges 10 cents. Under a split fare plan the bus company would have to accept 3 cents as its share of co-ordinated service unless the federal court should approve some other division.

East St. Louis Railway Buys Business—Ends Dispute

Sale of three of the four buses operated by the Herzog Motor Transport Corporation of Edwardsville, Ill., to the East St. Louis & Suburban Railway, East St. Louis, has been announced. Until recently the Herzog line operated the buses between Edwardsville and Glen Carbon, but was enjoined by the Circuit Court from further operations on complaint of the railway. The bus company had failed to obtain a certificate of convenience and necessity from the Illinois Commerce Commission, although the bus line was several years old. The sale of the buses is believed to have ended the dispute. The railway proposes to operate a bus line between the two towns, while F. W. Herzog, president of the motor corporation, will charter his single remaining bus to special parties, without a fixed schedule. He does not need a state certificate to use a bus in that manner.

Another Promise on New York Bus Matter

Mayor Walker of New York said on Dec. 13 at a meeting of the Board of Estimate that he expected the board to agree on the award of bus franchises, 116 applications for which are pending, not later than Jan. 15. The Mayor explained afterward that he had meant that the board by that time would agree not only on a policy as to whether bus operation should be borough-wide or city-wide, but also on the applicant or applicants to whom the franchises would be awarded.

According to one commentator the Mayor's announcement was interpreted at City Hall as indicating that there had been at least a tentative agreement between the Mayor, who has favored city-wide operation, and Comptroller Berry and most of the borough presidents, who are believed to have favored making separate awards for each borough.

Express Service Between Oakland and Berkeley

Express railway service between Oakland and Berkeley via Telegraph Avenue, supplemented by the operation of buses, which will make all stops, was set by the Key System Transit Company for Jan. 3 following receipt of word that its fleet of fourteen new buses would be ready for operation at that time. The new service will reduce by 25 per cent the present running time between Fourteenth Street, Oakland, and University Avenue, Berkeley.

The fare will be 7 cents while universal transfers will be issued to all crosstown lines, and from the buses to the street cars and from street cars to buses. A person can board a bus at any corner and transfer to the through street car line or any crosstown line, or can board a through car and transfer to the bus if he wants to alight at any street between the station stops of the through street cars. Buses will not operate on Sunday, and on that day the present street car service will be maintained.

New Coach Service Begun in Atlanta

Atlanta's ten new single-deck coaches were placed in operation on Dec. 1 on the Morningside and Virginia-Highland lines. They are equipped with every modern safety device and appliance to improve riding comfort. These include four-wheel hydraulic brakes, 7½-in. balloon tires, deep, leather-upholstered seats, ample ventilation facilities, tested heating systems and adequate lighting arrangements. Like the double-deck coaches placed in service last year, the new coaches are painted in a flamingo red and cream color scheme. Entrance and exit are by the front door, which is operated mechanically by the coach driver. The single-deck coaches do not replace the double-deckers, as the larger coaches will continue in service during the rush hours, but simply are providing a supplementary service which already is proving very valuable to patrons of both lines.

Financial and Corporate

New Financing for Brooklyn City Approved

The stockholders of the Brooklyn City Railroad, Brooklyn, N. Y., approved on Dec. 7 a plan to create a new general and refunding mortgage of unlimited amount and the issuance of \$2,500,000 of the bonds at the present time. As first drawn the plan contemplated the use of stock purchase warrant in connection with the bonds, but the bonds will be sold without the stock purchase warrant. Under the terms of the resolution adopted up to \$18,000,000 of bonds may be issued for general and refunding purposes on the present properties. Any further issue of bonds, however, must be secured by new properties.

Directors are empowered to issue bonds from time to time without the stockholders' consent and to give stock purchase warrants or make future bond issues convertible into stock. No action was taken on the plan to increase the capital stock. This remains at \$16,000,000. Funds received from the sale of the present issue of \$2,500,000 will be used, it is said, for the purchase of cars, the redemption of car trust certificates and other corporate purposes.

New Firm to Deal in Utility Securities

Stone & Webster, Inc., and Blodget & Company announce the formation of a new company under the name of Stone & Webster and Blodget, Inc. The corporation is a combination of the securities department of Stone & Webster, Inc., and the old investment house of Blodget & Company. The engineering and construction, management and investigating departments of Stone & Webster, Inc., are not included and will not be affected by the combination.

Bayard F. Pope, now a partner of Blodget & Company, will be president of the new corporation. Other officers and the directors will be drawn from both the participating companies, all the present partners of Blodget & Company being officers of Stone & Webster and Blodget, Inc.

Public utilities and others whose securities will be handled by Stone & Webster and Blodget, Inc., will have the advantage of a wider market through the combination than either of the companies could offer separately. Its facilities will be available not only for originating issues to be sold by the new house exclusively, but also to public utilities and other corporations in the sale of whose securities Stone & Webster and Blodget, Inc., will participate with other houses.

While the new corporation will be operated in an entirely independent capacity, it will have at its elbow the comprehensive engineering and construction and analysis service of Stone & Webster, Inc.

The officers of Stone & Webster and

Blodget, Inc., in addition to Bayard F. Pope, president, will be: C. E. Ober, H. R. Hayes and R. H. Carleton, senior vice-president; T. T. Whitney, Jr., P. L. Warren, J. D. Thomas, R. H. van Deusen, A. C. Dunmore, J. E. Baker and A. B. Griffin, vice-presidents; F. T. Pratt, secretary, and Howard F. Neill, treasurer.

The new company will begin operation on Jan. 1, 1927, at 120 Broadway, New York.

New Chicago "L" Issue Approved

Stockholders of the Chicago Rapid Transit Company, the elevated lines, on Dec. 9 approved an increase in the authorized prior preferred stock of the company from \$5,000,000 to \$10,000,000. The new issue of stock has been approved by the Illinois Commerce Commission. It is the intention of the directors to issue only \$1,500,000 at this time, to be sold through the Utility Securities Company. The new stock will pay a return of 7.2 per cent or 60 cents a share a month, instead of the 65 cents a month a share being paid on the present outstanding prior preferred, sold several years ago to employees and the public. In a notice sent with the latest dividend check to its passenger and employee partners the management said:

The lower rate of return of the new stock emphasizes the value of the present outstanding stock as an investment. The present stockholders should hold on to their holdings, because they will find it difficult to get an investment as reliable which pays as high a rate of return. The new rate of 7.2 per cent is a good return on a stock that is as safe as the prior preferred of the Rapid Transit Company. Shareholders who desire to increase their holding may make application now for the new stock to the Utility Securities Company.

The proceeds of the new issue of stock are to be used to meet capital expenditures for improvements and extensions to permit of the company doing a larger business. The money derived from the last stock sale was used for the purchase of new cars, for platform extensions and other capital expenditures which greatly enhanced the value of the properties.

\$4,656,000 Boston Elevated Issues Authorized

The Department of Public Utilities of Massachusetts has approved issuance by the Boston Elevated Railway two issues of bonds. The first totals \$2,700,000 to be put out on Feb. 1, 1927, at not more than 5 per cent or not longer than twenty years to refund West End Street Railway bonds maturing on that date. The second totals \$1,956,000 for the same period and with the same interest rate to be put out May 1, 1927, to retire the same amount of West End Street Railway bonds maturing then. The indentures by which these two issues will be secured will carry the provision for calling the bonds at 101 after the expiration of two years from the date on which they are drawn.

Another Hearing on Albany Fares

In figures submitted by the United Traction Company, Albany, N. Y., at the Nov. 30 hearing before the Public Service Commission on the petition of the company for a 10-cent fare it was brought out that the company had a net operating income of \$261,955 on its entire system for the nine months of 1926. Operating losses of \$21,552 in Troy and \$2,173 in Rensselaer were claimed by the company. General Manager Murphy said that the net operating revenue of \$222,496 shown in the comparative figures for Albany was virtually eliminated when fixed charges were deducted.

An adjournment was taken until Dec. 15 to enable the commission and city authorities to go over the data. John E. MacLean, general counsel of the company, said he would submit figures on behalf of the Capitol District Transportation Corporation separately, although the problems of the bus and trolley lines were much the same. The Capitol District Transportation Corporation, the bus operating subsidiary, has a similar petition pending.

Immense Refunding Issue by Indiana Company

Retirement of seventeen issues of securities, varying in amount from \$11,000 to \$1,834,300, by the Interstate Public Service Company, Indianapolis, Ind., will be effected through an issue of \$10,000,000 of first mortgage and refunding 5 per cent bonds which the company has sold to a banking syndicate. Nine of the issues which are being retired carry a 5 per cent interest coupon, one 5½ per cent, five 6 per cent, one 6½ per cent and one 7½ per cent.

In addition to providing for the retirement of these bonds, proceeds of the new issue will be used for additions and extensions to the property of the corporation, which is controlled by the Middle West Utilities Company.

Balance in Detroit Increases

For the year ended Nov. 30, 1926, the City of Detroit, Department of Street Railways reported railway operating revenue of \$22,788,523 against \$22,246,735 for a similar period of the year previous. The coach operating revenue was \$2,023,802 and \$702,596 for this year and last year respectively. The total revenue from all sources was \$25,075,554 against \$23,132,562 for the year ended Nov. 30, 1925. Total operating expenses were \$19,142,015 against \$17,060,802. In these two figures are included coach operating expenses of \$1,959,592 and \$673,299 for the years ended Nov. 30, 1926, and Nov. 30, 1925. Net revenue was \$5,933,539 against \$6,071,670 in November, 1925. The net income was \$3,243,243 for this year compared with \$3,440,529 for a year ago. The balance for the period was \$638,063 against \$562,741 for a similar period last year. Railway passengers carried in 1926 totaled 489,726,807 and 477,412,178 in 1925. The total number of passengers carried on the coaches was 25,804,419 this year against 9,435,872 for the year ended Nov. 30, 1925.

Receivers Named for Chicago Railways

Friendly Action Brought to Preserve Integrity of Company and Avoid Chaos and Confusion—Statement by Directors—Other Recent Moves Reviewed

THE Chicago Railways, the so-called West and north side surface lines, were placed in receivership on Dec. 15 by Federal Judge John H. Wilkerson. The petition for this action came from the Westinghouse Electric & Manufacturing Company, which represented that it had demanded \$67,075 in payment for electrical equipment for a substation and that payment had been refused. It asserted also that the funded debt of the company, totaling \$103,228,265, will fall due when the company's franchise expires on Feb. 1, 1927, and that this obligation cannot be met. To conserve the interests of every one it was urged that the company and all its assets and earning power be put into judicial custody. The Chicago Railways, operating in co-ordination with the Chicago City Railway, constitutes the Chicago Surface Lines.

The company through its lawyers admitted all the allegations and Judge Wilkerson appointed these three receivers: John J. Mitchell of the Illinois Trust Company, Frederick H. Rawson of the Union Trust Company and Henry A. Blair, president of the company.

The court authorized the lines placed under its protection to continue unified operation with the "city" system. This means the same service as at present with transfers and the same fares. For several years Chicago's Surface Lines have been charging a 7-cent fare. On the elevated lines the fare is 10 cents.

PROTECTION OF LAW NEEDED

In explaining the reasons for the receivership the directors of the Chicago Railways pointed out that the only way in which the company can provide for the obligations which will become due on Feb. 1 is the continued operation of the system and that the only way this can be assured is by placing the company's property under judicial protection.

No arrangement with the city for continuance of service after the expiration of the franchises could be carried out, it is declared, if the holders of overdue bonds should bring suits, obtain judgments and issue executions against the property.

"Seeing no way," the statement of the board of directors says, "by which to avoid the chaos and confusion which would result in local transportation if the properties were not in judicial custody when the many millions of indebtedness evidenced by bonds falls due on Feb. 1—in other words, believing a receivership to be inevitable in order to give authoritative assurance that efficient street car service can be provided—the directors authorized and directed counsel for the company to join in the application that the court take the properties into judicial custody to the end that the system may be kept intact and thus able to provide service to the car riders without interruption."

John J. Mitchell of the Illinois

Merchants' Trust Company, speaking for the receivers, said:

"In accepting appointment as one of the receivers it is with the hope that the receivers may be able to render a public service by bringing about between now and Feb. 1 concurrence among all interests in all street railway properties in some plan or arrangement which the city authorities might approve whereby for some reasonable period following Feb. 1, 1927, and without prejudice to any right of the city or to any interests in any of the properties, there may be continued the unified operation of all the surface lines with like effect as regards service to the public as though all such lines were owned and operated by one company.

"With the present unified service assured until Feb. 1 the immediate task of the receivers will be to work out if possible some plan, arrangement or understanding for the continuance after Feb. 1 of unified operation of the separate street railway properties in such a way that the city authorities may assent thereto without in any way prejudicing any of the rights of the city during the interval until a permanent solution of the traction problem is reached."

CITY COUNCIL AUTHORIZES SIX-MONTH FRANCHISE EXTENSION

An hour after the receivers had been appointed the City Council voted to authorize its local transportation committee to negotiate a six-month extension of the franchises of the rail-

ways. So many questions of a legal character were asked by the Aldermen that Mayor Dever said:

This is a critical situation. I have practiced law long enough to know that this is the time to ask the corporation counsel to think—not to talk. I hope you will not ask questions involving complicated legal questions, but rather confine your questions to those which are essential for you to get information upon which to cast your votes.

Aldermanic questions indicated that the Councilmen desire the law department to ask the federal court to compel the receivers to continue to pay 55 per cent of the railway's net receipts to the city, pave its right-of-way as the franchise stipulates, clean the streets and perform other obligations which it assumed in accepting the franchise.

Later in the week the Mayor charged that the receivership was part of a plot to defeat Chicago's administration plan to unify local transportation facilities and give the citizens a fair traction deal. He made this statement at a meeting of the Conference on Home Rule for Public Utilities called by the Illinois municipalities.

While the Mayor was speaking Leonard A. Busby, president of the Chicago City Railway, in a letter to Alderman McDonough, chairman of the committee on local transportation, announced that his company would accept a six months extension of the present traction ordinance, which expires on Feb. 1, 1927.

Corporation Counsel Busch promised the Council sub-committee on traction that on Monday or Tuesday he would file an intervening petition in the federal court to assure full protection of the city's rights in the receivership under the 1907 traction franchise ordinances.

A very brief recapitulation of some of the salient points in the local traction situation follows:

1. Franchises of companies whose properties are operated by the Chicago Surface Lines, largest street railway system in the world, expire on Feb. 1. These companies are earning a good margin of profit, but one of them has already gone into the hands of receivers.

2. Bankers interested in Surface Lines' securities have formed protective committees for practically all classes of security holders, and seem disposed to await events on and after Feb. 1 before taking further action.

3. F. J. Lisman, New York, has submitted a plan for refinancing of the Surface Lines' properties which has met with the opposition of the protective committees.

4. Chicago Motor Coach Company has offered to replace street cars with buses, which raises the question of what will be done in that event with the present properties and their security holders.

5. The City Council has made several attempts to deal with the problem, which thus far have come to nothing, apparently because of the gap between ideas as to what is financially and what is politically advisable. A proposal that expiring franchises be extended six months is still under consideration.

6. The State Legislature does not meet in time to deal adequately with its part of the problem. Chicago will probably present little opposition to a bill permitting the granting of terminable franchises to the railways, but will undoubtedly object to state control thereof, especially in matters of service.

7. Chicago has at present an unco-ordinated local transportation system composed of surface lines, elevated railroad and buses. Co-ordination of these facilities, with the possible construction of a loop subway, would greatly aid the development of the city and its metropolitan district.

Praise from a Financial Authority

THE bankers who have been identified with the Chicago Surface Lines for twenty years have formulated no plan for reorganization. With the earning power of the properties great as it is there should then be no difficulty in arriving at a sound financial plan. The Chicago Surface Lines are almost unique among street railways in the steady growth of their earnings. They carry annually about 850,000,000 passengers. The increase in passengers carried and in gross revenues this year is running better than 4 per cent above 1925.

Physically the property is exceptionally fine, it gives good service and has a substantial degree of public good will. The companies have been successful in obtaining reasonably remunerative fares from the courts, the value of their properties has been established beyond possibility of question. Even the city's appraisers have found actual value in excess of the "purchase price" established by the present ordinance. During the present régime millions of dollars have been collected in depreciation funds to meet heavy renewals that may be necessary some years hence.—BARRONS.

Merger Talk Again in Washington

The Public Utilities Commission of the District of Columbia has adopted the bill designed to induce the Washington Railway & Electric Company and the Capitol Traction Company to merge voluntarily. Enactment of the measure will be sought at the coming session of Congress.

Stripped of its verbiage, the measure contains three rewards for the companies if they consolidate and a heavy penalty in the form of a 50 per cent increase in the gross revenue tax if they fail to do so by July 1, 1928. The rewards are a guaranty against unlimited bus competition, repeal of the crossing policeman tax and repeal of the bridge repair tax.

Members of the committee explained that the bill is very similar to the joint proposals of the railways submitted several days ago, except that the objectionable service-at-cost plan, based on an agreed valuation, is removed. The commission bill also ignored the request of the companies that they be relieved from any obligation to pay the cost incident to the laying of new pavements for the permanent improvement of streets or highways utilized by them.

The commission decided to transmit the outline of the merger plan submitted by the railways to Congress, together with its merger bill, so that it may have independent consideration.

Acquisition of the Washington Rapid Transit Company by the North American Company was a violation of the public utilities act, William McK. Clayton, special legal adviser to the Public Utilities Commission, held in an opinion submitted to the commission. Mr. Clayton held that no other utility in the District and under the control of the commission offended the act of Congress by acquiring and holding the stocks and bonds of another public utility corporation without first securing the consent and validation of either Congress or the commission to such purchase and holding. Mr. Clayton warned the commission that should a merger of the street railway companies fail to be consummated "a very grave question" might arise as to the legality of the holdings of the North American Company in the Washington Railway & Electric Company and the Capital Traction Company.

The purchase of the Washington Rapid Transit by the North American Company, Mr. Clayton said, "seems to be the first instance" in the commission's fourteen years of control "where a public utility submitting to its jurisdiction desiring to buy or sell the stock or bonds of another public utility did not first apply for the consent of the commission to such purchase or sale."

Abandonments in Oswego Sought

Five petitions were filed with the Public Service Commission on Dec. 9 by the Empire State Railroad Corporation asking for approval of the abandonment of certain railway lines in the city of Oswego, N. Y. The petition states the directors of the railroad adopted a resolution on Oct. 26 in favor of the abandonment of the railway on

five different lines and that this resolution was adopted in a stockholders' meeting on Dec. 3. The petition further stated that the receipts from the electric lines on these routes did not meet operating expenses. This loss in conjunction with losses upon other routes in the city of Oswego was so great as to impair the solvency of the petitioner and threatened to destroy its ability to furnish railroad service of any kind over any of its lines. The commission will hold a public hearing on the application.

Long Receivership to Be Lifted

Property of Second Avenue Railroad, New York, to Be Sold Jan. 13—Reorganization Terms Reviewed

A plan to bring the Second Avenue Railroad, New York, out of receivership was made public on Dec. 15 by the committee representing holders of the road's receivers' certificates. It is proposed to buy the road at auction on Jan. 13 and then to form two corporations to control severally the real estate and railway properties of the company.

The proposed real estate corporation would have a bonded indebtedness not to exceed \$750,000 secured by a first mortgage on the carhouse property and a capital issue of 31,400 shares of no-par stock. This lien would be placed on the land and improvements only to the extent necessary to meet cash requirements in the event that such funds were not provided by the consolidated mortgage bondholders. The stock would be exchanged for receivers' certificates in the ratio of ten shares for each \$1,000 certificate.

The proceeds of the first mortgage loan, if placed on the property, would be used to the extent necessary to purchase an amount of the proposed railway corporation's first lien 6 per cent thirty-year bonds to provide cash for the latter corporation's operation. If the committee was able to bid in the road at a price within the amount of the certificates found to have been expended in preserving and operating the road, the amount of the first mortgage loan would be confined to cash requirements. The statement says:

The committee has been conferring with representatives of the consolidated mortgage bondholders on sundry proposals looking to the providing by them of the "cash requirements" in exchange for an interest in the railway corporation. This would save the carhouse property for the certificate holders free from lien. The principal obstacle has been the difficulty of arranging a contract to obtain power for operation. There is still a possibility that the consolidated mortgage bondholders will provide said "cash requirements."

The proposed railway corporation would acquire the property, rights, interests and franchises, exclusive of real estate. It would have a bonded indebtedness not to exceed \$750,000 of first lien 6 per cent 30-year bonds, and a capitalization of 31,400 shares of no-par stock. This stock would be exchanged ten for one for certificates in the event that cash requirements were met by a mortgage on the real estate. However, if they are met by bondholders, this stock would be divided between

bondholders and certificate holders in amounts to be determined by the committee.

The Second Avenue Railroad operates 26 miles of conduit railway in the Borough of Manhattan. The road has been in the hands of receivers since 1908. This is one of the longest receiverships on record.

Helena Properties Sold

Properties of the Helena Railway, Light & Power Company, Helena, Mont., were sold on Dec. 1 for \$584,500, under foreclosure proceedings, to the bondholders' committee, represented by C. M. Clay of the law firm of Simpson, Thayer & Bartlett of New York.

The plan proposed for the reorganization contemplates the segregation of the railway properties from the light properties. Two separate companies will be formed, one to take over the railway and the other to take over all of the activities of the company other than those performed by the railway. Holders of certificates of deposit under the agreement dated July 30, 1925, who assent to the plan will receive for each \$1,000 bond \$600 in 6 per cent bonds of the electric company and \$400 in cash, together with an amount of cash equivalent to interest at the rate of 5 per cent per annum upon 60 per cent of the principal amount of the old bonds from Sept. 1, 1925, to the date from which the new bonds bear interest and upon 40 per cent of the principal amount of the old bonds from Sept. 1, 1925, to the date to be selected by the committee for the distribution of the new bonds and cash to the holders of the certificates of deposit.

The electric company is to make an issue of 25-year 6 per cent bonds to be issued under and be secured by a mortgage constituting a first lien upon all physical assets and franchises of the electric company then owned and thereafter acquired and also upon the stock of the railway. The initial issue of bonds is to be \$750,000.

Another Step in Disposition of Rockford Properties

Charles J. Horn, Milwaukee, Wis., bought the physical properties of the Rockford, Beloit & Janesville Electric Railway, Rockford, Ill., at a foreclosure sale on Dec. 9 in that city for \$52,000. Mr. Horn was the only bidder. He bid in the property according to an arrangement under which it is expected T. M. Ellis, Jr., Beloit, will become the owner of the line within 60 days. The present sale relates particularly to the Rockford, Beloit & Janesville Electric Railway, formerly included as a part of the Rockford & Interurban Railway system.

Napa Valley Road Reported Sold

Rumor persists of the sale of the San Francisco, Napa & Calistoga Railway (electric) to the Western Pacific Company. The rumor has been strengthened by the reported sale of the Sacramento Short Line to the Western Pacific. It is generally known that the Napa Valley road has recently defaulted in interest payments on its

bonds. Control of the road is held by James Irvine, Seattle. Its tracks connect Vallejo with Calistoga, and it reaches San Francisco through a traffic agreement with the Monticello Steamship Company.

New York City Companies Would Consolidate

A joint petition of the Eighth Avenue Railroad and Ninth Avenue Railroad, New York, has been presented to the Transit Commission praying that the commission authorize the petitioners to merge and consolidate the capital stock, franchises and property of each petitioner pursuant to a joint agreement duly entered into by them, so as to form one corporation under the name of "Eighth & Ninth Avenues Railway."

States Condition of Former Railway Property.—The Denver & South Platte Railway, which until last May operated tramcars between Littleton and Englewood, Col., recently advised that all physical property had been removed from the right-of-way and sold in accordance with authorization from the Public Utilities Commission.

Worcester, Too, Accepts New Haven Control.—The committee on streets of Worcester, Mass., formally accepted the ruling of the 1926 Legislature that the New York, New Haven & Hartford Railroad be permitted to resume control of the Worcester Consolidated Street Railway. The matter was taken up to answer a petition of the New Haven road to the City Council that it be allowed to take over and control the holdings in accordance with the wishes of the city. The City Council and Mayor O'Hara favor the arrangement.

Opportunity Given to Buy Shares.—An opportunity is afforded the patrons and employees of the Winnipeg Electric Company, Winnipeg, Canada, to become partners of and share in the earnings of the railway. The company is offering 2,500 shares of its 7 per cent cumulative preference stock. The shares are offered to company employees at par, \$100 per share, and may be bought for cash or on partial payments of \$10 cash and \$10 per month per share. In order to give a large number of customers and employees the opportunity to participate, the company is limiting the number of shares to any one person to 50. The sale will close on Dec. 23.

Approval Sought for Intercompany Financing.—The San Francisco-Sacramento Railroad, Oakland, Cal., has applied to the Railroad Commission for authority to execute a mortgage in favor of the Sacramento Northern Railway in the sum of \$98,430. This will be payable in one year from date, with interest at 6 per cent, covering money borrowed from the mortgagee.

O. H. Wathen a Louisville Director.—O. H. Wathen has been elected a director of the Louisville Railway, Louisville, Ky. Mr. Wathen will replace W. S. Campbell, chief engineer and general manager of the Kentucky & Indiana Terminal Railroad, who resigned.

Personal Items

C. W. Wilson Research Manager

Pittsburgh Railways Designates Official to Head Important Activities—Many Years Experience

Clyde W. Wilson has been appointed by the Pittsburgh Railways, Pittsburgh, Pa., to the position of manager of the research department—a department which has been lately created for the purpose of rendering a service to the operating officials in the way of instruction concerning production and sales of railway transportation in other cities as well as complete and up-to-date information about all branches of the properties of the Pittsburgh Railways.

At the time of the reorganization of



C. W. Wilson

the company at Pittsburgh, Mr. Wilson was made assistant to the general manager and served in this capacity and as assistant to the vice-president until his appointment to head of the research department.

The choice of Mr. Wilson for this position is particularly fortunate, his wealth of knowledge gained through years of experience both in electric railway and railroad transportation having fitted him thoroughly for this work.

The activities of his department range from investigations which may be so important as to indicate broad changes in policy or method to minute analyses of local operating cost. Information is secured by means of visits by the research manager and research engineer to other properties, through contact with associations, from trade journals, by maintaining a newspaper clipping service, from other companies direct, and from any other sources available.

Mr. Wilson was born near Covington, Ky., and was educated in the public schools and at Kentucky State College at Lexington. From 1902 until 1906 he worked for the Erie Railroad, the Cincinnati, Hamilton & Dayton, now part of the B. & O., and Chicago, Cin-

cinnati & Louisville Railroad, now part of the Chesapeake & Ohio Railroad.

In 1906 he became associated with the Cincinnati Traction Company and served in various positions of the operating department until 1920, when he was asked to come to Pittsburgh to help Thomas Fitzgerald, at that time a consulting electric railway engineer and now vice-president of the company, in the work preliminary to the reorganization of the Pittsburgh Railways.

Changes in Personnel at Ludington

The Michigan United Light & Power Company, Grand Rapids, Mich., announces changes in personnel made since the recent formation of the Pitkin power group in Michigan. Under the new plan W. A. Wadsworth, manager of the southern territory since last March, has been made vice-president and general manager to direct the Michigan properties of the concern. His headquarters will be temporarily in Ludington, Mich., that he may supervise the management of the Ludington district.

Management of the Michigan Public Service Company at Sheboygan will be in charge of F. A. Swanson, Ludington, who will be succeeded as local superintendent by F. B. Swanson at Hart. C. L. Mosher will be plant engineer and load dispatcher for the state. He formerly was with the Consumers Power company at Jackson. C. G. Pitkin has been promoted from the Hart office to Ludington. Work in connection with the accounting and the construction activities of the company will be consolidated.

B. F. Pope Heads New Investment Firm

Bayard F. Pope has been elected president of Stone & Webster and Blodget, Inc., which will succeed on Jan. 1 to the securities department of Stone & Webster, Inc., and the investment house of Blodget & Company, as noted elsewhere in this issue. Mr. Pope has risen steadily in the investment banking field. After he was graduated from Harvard in 1908, he joined the Chicago banking house of Mason, Lewis & Company. This corporation was dissolved in 1910 and Mr. Pope joined Blodget & Company, by which he was charged with the responsibility of developing the New York office. Shortly after this country's entry into the war he enlisted for work in the publicity department of the Liberty Loan Committee, where, under Gov. Benjamin Strong, he did remarkable work as vice-director of publicity in charge of advertising, his department laying out the entire plan for liberty loan work throughout the country. He was made a partner in Blodget & Company in 1919. In addition to being president of the new company, Mr.

Pope is also a director in a number of other corporations, including Engineers Public Service Company, General Public Service Corporation, Virginia Electric & Power Company and New England Power Association.

Illinois Power & Light Purchasing Department Changes

Changes have been announced in the organization of the purchasing department of the Illinois Power & Light Corporation, Chicago, Ill.

Frank H. Hughes is appointed supervisor of purchases with headquarters at Chicago.

H. J. Vance is appointed purchasing agent for the Illinois properties of Illinois Power & Light Corporation, acting in that capacity both for the various Illinois divisions and for the Illinois Traction System. Mr. Vance also will have direct charge of the Decatur storehouse, and his offices will be located at Decatur.

J. A. Jefferis is appointed fuel purchasing agent with headquarters at St. Louis, having responsibility for the purchase of coal and other fuels for all the various state groups of the company.

G. M. Eaton with Molybdenum Corporation

G. M. Eaton, chief mechanical engineer of the Westinghouse Electric & Manufacturing Company, has identified himself in a sales engineering capacity with the Molybdenum Corporation of America.

With Westinghouse he soon associated himself prominently with railroad electrification problems and his success in that field is attested by his prominence in work associated with the mechanical features of electric locomotives for the Pennsylvania, the New York, New Haven & Hartford, the Norfolk & Western and the Chicago, Milwaukee & St. Paul Railroads.

In 1910 Mr. Eaton was appointed division engineer of the railway department, where the scope of his activities was widened. In 1919 he was made chief mechanical engineer of the Westinghouse company. Many inventions are accredited to him. They include developments in the field of complete locomotive design, motor mounting, motor details and overhead line construction. He will continue a curtailed association with the Westinghouse company in the capacity of consultant on mechanical engineering problems.

Changes in Kewanee

In line with the new plans for supplying current to the Kewanee Public Service Company, Kewanee, Ill., a change will be effected in the personnel. Jean DeCamp, superintendent of the railway system for the last two years, and Max Bertch, master mechanic, will leave soon for Texarkana, Tex., where they will join the Southwestern Gas & Electric Company, occupying positions there similar to the ones they held in Kewanee. E. T. Crocker, Quincy, has been transferred to have charge of the railway at Kewanee.

A. T. Spencer at Montreal

Former Toronto Official Becomes General Superintendent of Construction and Maintenance of Quebec Property

A. T. Spencer has joined the staff of the Montreal Tramways, Montreal, Que., with the title of general superintendent of construction and maintenance. Since May, 1924, he has been assistant to the general manager of the Toronto Transportation Commission, Toronto, Ont., operating the municipal electric railway there. Before that he was engineer of way of the Toronto Commission. As assistant general manager at Toronto he continued to supervise the operation of the way department.

HELPED TO REHABILITATE TORONTO PROPERTY

Mr. Spencer was appointed to the important position of engineer of way of Toronto Transportation Commission in May, 1921, in anticipation of the extensive rehabilitation program which



A. T. Spencer

began when the commission took over the local lines the following September. This work might have been accomplished in a leisurely manner, but the idea of leisure in rehabilitating the property of the Toronto Railway did not enter into the thought of the Transportation Commission, appointed by the city to take over and operate the Toronto Railway and consolidate it with the lines then owned by the city. The city had suffered too long from bad tracks and poor cars and been inconvenienced in too many other ways to be at all tolerant of any program which countenanced dallying with the work in hand.

200 MILES OF TRACK REBUILT

As explained in the *ELECTRIC RAILWAY JOURNAL* for May 10, 1924, in the personal about Mr. Spencer at the time he was made assistant to the general manager at Toronto, quantity production methods were worked out for the reconstruction of nearly 200 miles of track, and the matter was handled so well under his direction and supervision that all of the work was done during two seasons. In order to carry out this work successfully in the very short space of time in which Mr. Spencer accomplished it, he had to

resort to many novel methods and to exercise a great deal of ingenuity.

Mr. Spencer brought to the work which he did at Toronto a fund of information gained while serving with other railways and while engaged in other similar lines of work. For a few months prior to his appointment under the Toronto Transportation Commission in May, 1921, he acted as assistant engineer in the railway department of the Hydro-Electric Power Commission of Ontario. Before that he had been connected with the Montreal Tramways, first as assistant engineer in charge of maintenance of way and later as chief engineer of this department. Previous to that he was employed by the Canadian Pacific Railway on grade revision in New Brunswick, Quebec and Ontario. In 1907 he was appointed assistant engineer of the Montreal Park & Island Electric Railway, and it was from this company that he went to the Montreal Tramways.

Mr. Spencer entered upon his engineering career in 1901 with the Dominion Coal Company and the Sydney & Louisburg Railway. He was born in Nova Scotia and there received his general and technical education. In all the work that he has done Mr. Spencer has shown a remarkable capacity for carrying out the job efficiently.

ACTIVE IN ASSOCIATION WORK

He is a member of the standing committee on way and structures of the American Electric Railway Engineering Association and is chairman of the special committee of that association appointed to study the use of alloy steels, other than manganese, in special trackwork. He is an associate member of the Engineering Institute of Canada, a member of the Association of Professional Engineers of Quebec, a member of the Association of Professional Engineers of Ontario and a member of the American Society of Municipal Improvements.

A. P. Way, formerly assistant electrical engineer of the American Electric Power Company, successor to the American Railways, Philadelphia, is now assistant engineer in the electrical division of the Department of City Transit at Philadelphia. He was connected with the Wilmington & Philadelphia Traction Company, a subsidiary of the American Electric Power Company, immediately before taking his present position.

Roy L. Zinstine has been appointed supervisor of safety and first aid of the electrical department of the Pennsylvania-Ohio Electric Company, Youngstown, Ohio. This is a newly created position. In 1921 Mr. Zinstine went to the Pennsylvania-Ohio system as a truck driver in Youngstown. He was one of the 26 employees who elected to take the Red Cross first aid training in the institute organized by Dr. Redden.

R. G. Soper has been elected treasurer of the Southwestern Public Service Association, Dallas, Tex. For many years Mr. Soper was active in the manufactured and later the natural gas industry. He was also secretary of the Dallas Gas Company.

W. G. Holmes has been appointed industrial agent for the Interstate Public Service Company, Indianapolis, Ind. Mr. Holmes was connected with the Indianapolis Chamber of Commerce at the time of his appointment. He is a graduate of Colgate University, where he specialized in mathematics, engineering and economics and where he served as assistant instructor in engineering two years prior to his graduation. From September, 1925, to March, 1926, he was with the Bureau of Business Research at Indiana University. As industrial agent of the Interstate he succeeds the late Anderson G. Moore.

R. M. Vaughan, who has been in charge of valuation work in the engineering department of the California Railroad Commission for a number of years, has resigned to engage in private practice.

B. M. Lathrop recently retired as general superintendent of the Colorado Springs & Interurban Railway, Colorado Springs, Col. He had been associated with the company for the past 25 years.

A. E. Haak has succeeded **B. M. Lathrop** as general superintendent of the Colorado Springs & Interurban Railway, Colorado Springs, Col. For some time he has been purchasing agent of this company. He will continue in that capacity.

J. J. Flynn has been appointed general storekeeper for the Chicago Rapid Transit Company, Chicago, Ill., succeeding **R. R. House**, who was recently promoted to general superintendent of stores for the four electrically operated railroads under the management of the Insull interests. Mr. Flynn has been an employee of the Chicago Rapid Transit Company for fourteen years.

Francis J. Gannon has resigned as assistant treasurer of the Northern Texas Traction Company, Fort Worth, Tex., to take over the duties of assistant treasurer and secretary of Davis Islands, Inc., a development at Tampa, Fla., under Stone & Webster management. He had been assistant treasurer of the Northern Texas Traction for the past ten years. More recently he had also been handling the advertising for the company. **A. A. Chamberlain** has succeeded Mr. Gannon as assistant treasurer.

Dr. W. B. Coffey, chief surgeon of the Market Street Railway, San Francisco, Cal., for almost 25 years, resigned as head of the medical department to become chief surgeon and general manager of the Southern Pacific Hospital System.

Charles H. McEachron has recently been appointed superintendent of the Tacoma Municipal Belt Line, Tacoma, Wash. He succeeds in this capacity **A. Gunderson**. Reconditioning of the rolling stock of the belt line will be undertaken at once by the newly appointed superintendent, it was stated by Mayor **M. G. Tennent**. The appointment is temporary, it is said. Mr. McEachron has been foreman of the machine shop of the Tennent Steel Casting Company, of which Mayor Tennent is the head, for the last three years.

James Dalrymple Retires

Glasgow Manager with World-Wide Reputation Will Relinquish Post After 46 Years of Service

James Dalrymple, general manager Glasgow Corporation Tramways, Glasgow, Scotland, recently intimated to the tramway committee of the corporation that he is prepared to retire from his position. The information was conveyed to the committee in the course of a discussion on a proposal that a considerable number of tramway employees who were dismissed by the manager because of their action during the general strike in May last should be reinstated. This proposal had come before the committee on previous occasions, and Mr. Dalrymple was firm in his attitude that as regards the particular men he would not take them back. In this he was supported by the majority of the committee and the Council. Despite this indorsement of him, Mr. Dalrymple decided that, taking all the circumstances into consideration, it would be inexpedient for him to carry on. He therefore intimated that he now proposed to exercise, as he was entitled to do under the corporation's scheme of superannuation, the option he had of retiring. He added that he wished to be relieved of his duties Dec. 31.

In all this politics has played its part. At a recent municipal election the socialist party gained a number of seats, and though the socialists are still in a minority, their number is now nearly as great as that of the moderate party. It is said that some of the latter were absent from the meeting of the committee on Nov. 18 so that the socialists had a small majority and carried their motion for reinstatement. Meanwhile Mr. Dalrymple had sent in his notice of willingness to retire. A small committee was appointed to consider the terms on which the resignation would be accepted.

Mr. Dalrymple has been in the service of Glasgow Corporation for 46 years. He was originally in the accounting department. When the tramways were municipalized in 1894 he became tramway accountant, and in 1902 he was appointed deputy general manager. Some two years later when the late **John Young**, then general manager, resigned in order to take a similar position with the Metropolitan District Railway, London, Mr. Dalrymple was appointed general manager. That post he has held since with conspicuous ability and success, both as regards the operating and financial sides of the undertaking. Under him the Glasgow Tramway has not only maintained its position as one of the successful undertakings of its kind in Great Britain, but has enhanced its position.

Mr. Dalrymple has visited the United States from time to time to study traffic conditions. On one memorable occasion when he was called in to advise, he strongly opposed the municipalization of railways in Chicago. By means of personal inspection he has also mastered street transport conditions on the Continent of Europe. Two years ago he went on invitation to Bombay,

India, to advise as to the tramway development in the city. During the war he raised a battalion from among the Glasgow tramway employees in one day, and others followed. For these and other services during the war he received the C.B.E. decoration.

It was through Mr. Dalrymple's successful efforts during the general strike in May last to maintain tramway service in Glasgow by the engagement of volunteers that he incurred the enmity of socialists in the Town Council. The hostility thus aroused against him has been intensified by his subsequent refusal to reinstate certain strikers. It appears that he was willing to consider applications from some of them in the event that vacancies arose but he would not agree to reinstatement of the men en masse at present.

P. E. Dufour has been appointed valuation engineer of the California Railroad Commission, effective Jan. 1, 1927, to succeed **R. M. Vaughan**, who recently resigned from the service of the commission. Mr. Dufour has been with the transportation division of the commission's engineering department since March, 1921, at which time he was employed to make an extensive check of the federal valuation of the steam railroads in California. He has handled the valuation work on several of the large investigations made by the commission. Previous to his employment by the state Mr. Dufour was associated for six years with the bureau of valuation of the Interstate Commerce Commission. In addition to this work he has had considerable railroad experience, having been employed a number of years with the Southern Pacific Company, six years of which time he was assistant engineer in charge of railroad construction in California and Oregon. He was graduated in 1904 from the Van der Naillon School of Engineering.

B. P. Shearon has been elected secretary of the Northern Indiana Public Service Company, Hammond, Ind. He succeeds **W. D. Boone**, who has resigned because of illness. Mr. Shearon has been connected with the company for nineteen years. He formerly was comptroller of the company and for the last two years has been assistant secretary and assistant treasurer.

Obituary

Joseph Alvin Reckard, for 26 years cashier of the Los Angeles Railway, Los Angeles, Cal., died recently. Mr. Reckard was 66 years old. Prior to his going to the Los Angeles Railway in 1900 he was agent for the Toledo, Peoria & Western Railway at Fairbury, Ill.

Frederick G. Orcutt, assistant paymaster of the Connecticut Company at Hartford, Conn., died on Dec. 2 at his home in that city. Before going to the Connecticut Company he had been employed in similar capacities by the Boston & Maine and the New York, New Haven & Hartford Railroads. Mr. Orcutt was born in 1862.

Manufactures and the Markets

News of and for Manufacturers—Market and Trade Conditions
A Department Open to Railways and Manufacturers
for Discussion of Manufacturing and Sales Matters

Big Car and Bus Purchase Program at Atlanta

Ten new single-deck coaches have been placed in service by the Georgia Railway & Power Company, Atlanta, Ga. Purchase of the new coaches raises still higher the record of new transportation equipment purchased during the year, a mark which already had eclipsed any previous year in Atlanta's history. In addition to the ten coaches, the company has purchased and placed in service during 1926 60 new street cars for city lines and ten new de luxe interurbans for the Atlanta Northern and Stone Mountain lines.

Westinghouse Gets Big Order in Brazil

Award of a contract from the Paulista Railway in Brazil for the extension of that road from Rio Clare to San Carlos, a distance of 42 miles, has been made to the Westinghouse Electric International Company. This contract includes complete transmission line equipment, catenary contact system, together with necessary substation equipment and locomotives. The locomotives to be furnished will be duplicates of several built by the Westinghouse company and shipped to Paulista a few months ago. They represent the fourth order for that company to be placed with the Westinghouse company. The contract price for this present order is in the neighborhood of \$1,500,000, it is reported.

M. J. A. Bertin Heads Galena Signal Oil

M. J. A. Bertin, who for several years has been in charge of the European business of the Galena Signal Oil company, has been elected president and a

director, succeeding L. J. Drake, who resigned to become president of the Union Tank Car Company.

Twin Cities Improvements Intimated

Improvements for 1927 to be made by the St. Paul City Railway, St. Paul, Minn., will cost about \$350,000, with no definite outline yet made. A proposed new interurban line connecting the Franklin Avenue line in Minneapolis with the Rondo-Maria line would cost the St. Paul company \$1,500,000, according to T. Julian McGill, vice-president of the Twin City Rapid Transit Company, and would require a larger fare. Otherwise construction of the line would not be possible for some years.

In Minneapolis the requests for railway extensions and improvements would, if carried out, cost the Minneapolis property \$600,000 more than the fund available. In 1926 the outlay was \$650,000, but for 1927 it will be less than this sum.

Oil-Electric Locomotive in Lumber Service

A new use for oil-electric locomotives has been found with the placing of a 100-ton unit of this type in service at Westwood, Cal., hauling logs from the woods to the mill of the Red River Lumber Company. The locomotive was built jointly by the American Locomotive Company, Ingersoll-Rand Company and the General Electric Company, and is similar in its general characteristics to other oil-electric units of the same tonnage which have been built for use by various railroads in the past years. The unit, which is operated by the Red River Lumber Company, is kept in daily operation over a 20-mile section of track.

Cold Facts at Disposal of Manufacturers

Discussion of Results Obtained with New Equipment Given by Charles Gordon at Cleveland Convention Ready in Booklet Form

Early in the week of the American Electric Railway Association convention in Cleveland last October a group of important electric railway manufacturers and their representatives gathered together at the invitation of James H. McGraw, president of the McGraw-Hill Publishing Company, Inc., to discuss various conditions affecting the purchase of new equipment in the industry. At this meeting Charles Gordon, editor of *ELECTRIC RAILWAY JOURNAL*, analyzed carefully the results which are actually being obtained by various properties which have shown a willingness to modernize their rolling stock. The questions of whether it costs less to buy new cars than to maintain old ones and whether the industry is actually paying for new equipment and then not getting it were answered in no uncertain terms.

So many requests were received by the *JOURNAL* for copies of Mr. Gordon's remarks that it was decided to publish them in booklet form for general distribution. Copies are being sent to manufacturers throughout the industry and an adequate supply of additional copies has been prepared for distribution to those who may request them. The booklet is illustrated with a number of charts which graphically portray the anomalous condition which is in existence at the present time and the common sense answer to the whole puzzling situation. It is hoped that this compilation of specific facts will prove of material assistance in the campaign to infuse new blood into the veins of the industry through the guise of modern rolling stock.

New Testing Laboratory for Delta-Star Electric

The Delta-Star Electric Company, manufacturer of unit type high-tension equipment, has constructed a new large testing laboratory in its plant at Chicago, Ill., for the use of its designing



Type of Load Hauled by This Oil-Electric Locomotive

engineers. The company feels that this will afford the means of securing the data necessary so that the equipment offered for sale will meet the severe conditions imposed by modern interconnection of the transmission system.

Included in the equipment of the laboratory are transformers, each of 250 kva. capacity and weighing approximately 18 tons each. They have primaries of 2,000 volts, secondaries of 250,000 volts and are arranged for the cascade or chain connection.

Excitation and control of the transformers is secured by a synchronous motor-generator set, the 2,000-volt winding of the first transformer being connected directly to the alternator. With three transformers in series there are 750,000 volts between the high-tension terminal of the third transformer and ground.

Another Instance of Manufacturer Co-operation

In mailing its recent dividend checks to stockholders, the Westinghouse Electric & Manufacturing Company expressed the hope that they would endeavor to ascertain the facts regarding local electric railway service and lend a helping hand toward establishing a favorable attitude of mind toward the electric railway. It said that this would result not only in better service for the people, and aid the prosperity of the stockholder's neighborhood, but would also benefit him as a part of the great Westinghouse organization.

The company said that the electric railway system of any city is a true mirror of the progressiveness of that

community, for upon these transportation facilities, as a keystone, depend social and industrial progress. It then set forth these facts:

Since the establishment, 40 years ago, of the first transportation systems operated by electricity, this industry has made steady and healthy progress until today it represents an investment of \$6,000,000,000 with securities held by 1,300,000 people; operates 105,000 cars and 50,000 miles of track; and carries more than 16,000,000,000 passengers annually.

Your company has been privileged to be identified with this basic public utility for the past 40 years and is in a particularly favorable position to appreciate the full value of its service and the importance of public understanding and co-operation.

For the past decade your company has endeavored to tell the public the facts and thereby to secure a better public understanding of the economic service rendered by the electric railways. This has been accomplished by a consistent program of co-operative advertising in the leading national popular media such as *Forbes*, the *Literary Digest*, *Scientific American*, *Collier's*, the *Nation's Business* and *Saturday Evening Post*, and in many financial papers.

In Special Publication 1751, "Electric Railways—The Keystone of Progress," are reproduced some of the most important of these advertisements. The 24 illustrated represent a combined circulation of 26,324,000, or in reality that number of individual messages delivered in behalf of the electric railway industry.

Large Equipment Order Placed by Long Island

Electrical equipment valued at approximately \$700,000 is to be added by the Long Island Railroad. This expenditure will be made on equipment for 60 motor and 30 trail cars. The order calls for a duplicate of equipment previously purchased from Westinghouse by the railroad. Delivery is to be made in the spring to meet the requirements of heavy traffic. When

the added cars go into operation the Long Island Railroad will have in service approximately 700 Westinghouse equipped motor cars.

Rolling Stock

Chicago, Aurora & Elgin Railroad, Aurora, Ill., is reported to be inquiring for fifteen additional interurban cars at the present time.

Utah Light & Traction Company, Salt Lake City, Utah, has purchased two 230-in. wheelbase Mack bus chassis, on which will be mounted Duralyte street car type bodies. The buses will be put in trolley feeder service between Bountiful and Centerville, an 8-mile route at a 20-cent fare. The schedule calls for eighteen trips daily.

Chicago, South Shore & South Bend Railroad, Michigan City, Ind., is making inquiries for ten motor cars and ten trailers.

Brooklyn City Railroad, Brooklyn, N. Y., expects to issue specifications about Feb. 1, 1927, for from 175 to 190 new cars. Since this matter was referred to originally in the *ELECTRIC RAILWAY JOURNAL*, issue of Nov. 20, page 952, it has been decided that the new rolling stock will be similar to the cars now on the property, known as type 8,000. After these cars are delivered and older cars have been retired the company will have no cars in operation built earlier than 1920.

New Advertising Literature

General Electric Company, Schenectady, N. Y., has issued a leaflet describing its new automatic welding head which provides automatic electrode feeding of the magnetic clutch type. The welding head and control are available either separately or as a part of a complete automatic welding equipment.

Ohmer Fare Register Company, Dayton, Ohio, describes its Odometer in a publication issued recently. This device is intended for application to electric and steam railway cars, trucks, buses and Drivurself cars. The company says that the Ohmer Odometer for railway service accumulates total mileage whether the car is going forward or backward. It requires no attention after once applied, and continuous, accurate and uninterrupted mileage reading are assured. When applied to railway service there is no change in the head or principles of its operation.

Pennsylvania Railroad, Philadelphia, Pa., has placed orders for 60 all-steel electric cars for suburban service in the Philadelphia district. The orders were distributed as follows: Standard Steel Car Company, 30; Pressed Steel Car Company, fifteen, and American Car & Foundry Company, fifteen. Electrical equipments for these units were ordered some time ago, as reported in the issue of the *JOURNAL* for Nov. 13, page 912. The cars will be placed in service early in 1928 upon completion of electrification between Philadelphia and Wilmington, Del., and Philadelphia and West Chester, Pa.

ELECTRIC RAILWAY MATERIAL PRICES—DEC. 14, 1926

Metals—New York

Copper, electrolytic, cents per lb.	13.375
Lead, cents per lb.	7.887
Nickel, cents per lb.	35.00
Zinc, cents per lb.	7.41
Tin, Straits, cents per lb.	68.625
Aluminum, 98 to 99 per cent, cents per lb.	27.00
Babbitt metal, warehouse, cents per lb.	
Commercial grade.	63.00
General service.	32.50

Bituminous Coal

Smokeless mine run, f.o.b. vessel, Hampton Roads	\$9.00
Somerset mine run, Boston	3.25
Pittsburgh mine run, Pittsburgh	2.75
Franklin, Ill., screenings, Chicago	1.875
Central, Ill., screenings, Chicago	1.725
Kansas screenings, Kansas City	2.35

Track Materials—Pittsburgh

Standard steel rails, gross ton	\$43.00
Railroad spikes, drive, Pittsburgh base, cents per lb.	2.90
Tie plates (flat type), cents per lb.	2.35
Angle bars, cents per lb.	2.75
Rail bolts and nuts, Pittsburgh base, cents, lb.	4.20
Steel bars, cents per lb.	2.00
Ties, white oak, Chicago, 6 in. x 8 in. x 8 ft.	\$1.45

Hardware—Pittsburgh

Wire nails, base per keg	2.65
Sheet iron (24 gage), cents per lb.	3.00
Sheet iron, galvanized (24 gage), cents per lb.	3.85
Galvanized barbed wire, cents per lb.	3.35
Galvanized wire, ordinary, cents per lb.	2.50

Waste—New York

Waste, wool, cents per lb.	12-18
Waste, cotton (100 lb. bale), cents per lb.:	
White	13-17.50
Colored	10-14

Paints, Putty and Glass—New York

Linseed oil (5 bbl. lots), cents per lb.	11.40
White lead in oil (100 lb. keg), cents per lb.	14.00
Turpentine (bbl. lots), per gal.	\$0.91
Car window glass, (single strength), first three brackets, A quality, discount*	84.0%
Car window glass, (single strength), first three brackets, B quality, discount*	86.0%
Car window glass, (double strength) all sizes, A quality, discount*	85.0%
Putty, 100 lb. tins, cents per lb.	5.25-5.50

* Prices f.o.b. works, boxing charges extra.

Wire—New York

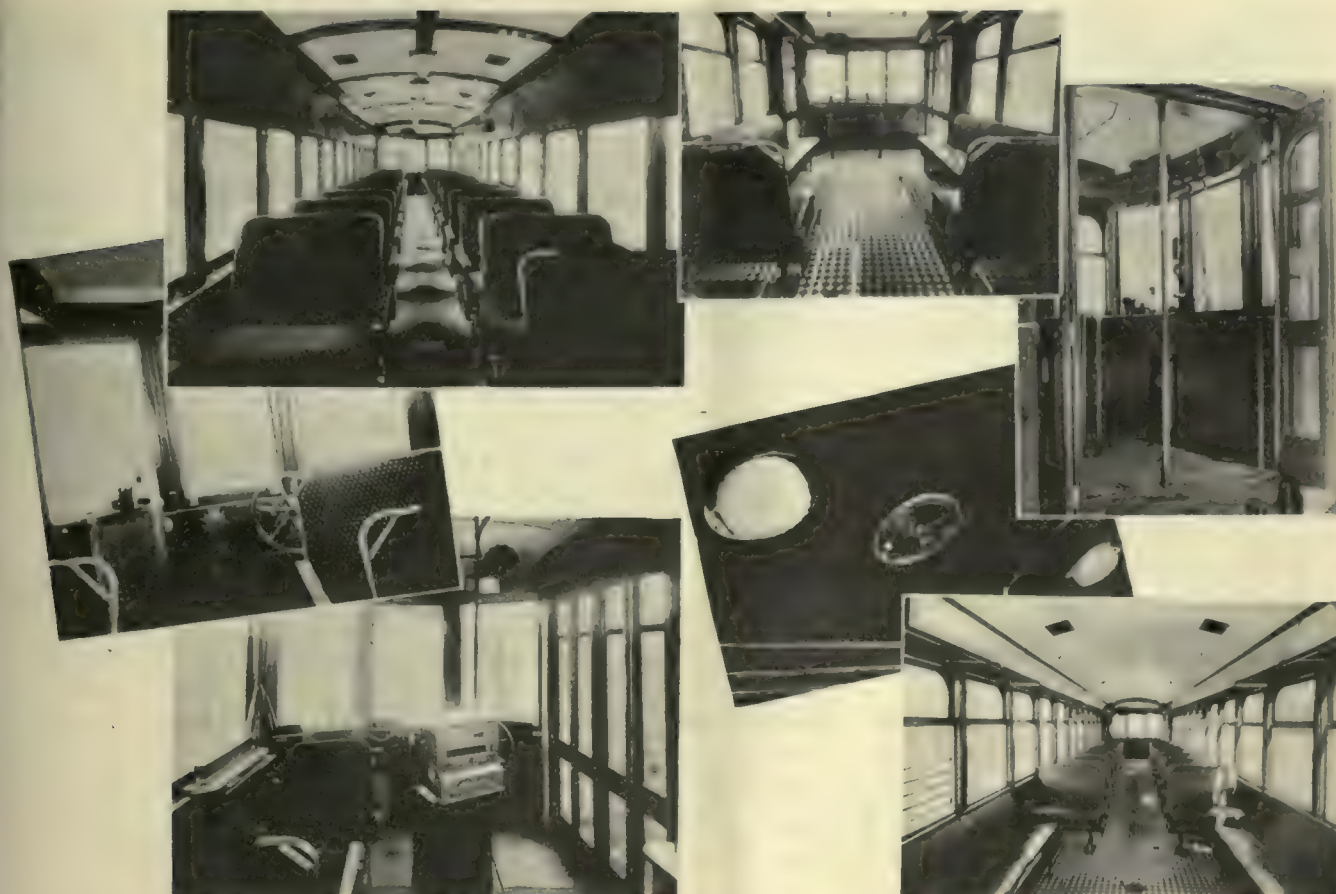
Copper wire, cents per lb.	15.75
Rubber-covered wire, No. 14, per 1,000 ft.	\$6.00
Weatherproof wire base, cents per lb.	17.50

Paving Materials

Paving stone, granite, 5 in. New York—Grade 1, per thousand	\$142.40
Wood block paving 3½, 16 lb. treatment, N. Y., per sq. yd.	\$2.70
Paving brick 3½x8½x4, N. Y., per 1,000 in carload lots	51.00
Paving brick 3½x8½x4 N. Y., per 1,000 in carload lots	45.00
Crushed stone, 1-in., carload lots, N. Y., per cu. yd.	1.94
Cement, Chicago consumers' net prices, without bags	2.10
Gravel, 1-in., cu. yd., f.o.b. N. Y.	1.75
Sand, cu. yd., f.o.b. N. Y.	1.00

Old Metals—New York and Chicago

Heavy copper, cents per lb.	10.85
Light copper, cents per lb.	9.25
Heavy brass, cents per lb.	6.50
Zinc, old scrap, cents per lb.	4.25
Lead, cents per lb. (heavy)	5.75
Steel car axles, Chicago, net ton	\$17.25
Cast iron car wheels, Chicago, gross ton	14.75
Rails (short), Chicago, gross ton	16.50
Rails, (relaying), Chicago, gross ton	28.50
Machine turnings, Chicago, gross ton	6.75



Every Effort Has Been Made to Give an Attractive Appearance to the Interiors of the New Youngstown City Cars.

Another Coffin Medal Winner uses Peacock Staffless Brakes!

To be specified by Coffin Medal Winners for several years straight is significant in itself. But when it is noted that almost every progressive electric railway equips its modern cars with Peacock Staffless Brakes, this gains added significance.

Note the Peacock Staffless in the new Youngstown City Cars of the Coffin Medal winning Pennsylvania-Ohio Electric Company. It is one of the features adopted by the Company in its effort to give the interiors of these cars an attractive appearance.

Lightweight, combined with tremendous braking power, low installation and maintenance costs, simplicity of operation and their occupation of minimum platform space, are a few of the factors which demand Peacocks in modern car design.

Get facts and figures of what they have done for others and what they will do for your modern cars! We will gladly mail them to you on request.



NATIONAL BRAKE CO., Inc.
890 Ellicott Square, BUFFALO, N. Y.



Tests in Service

Put Generals on New York busses

*Fleet of 15 Macks rides on tire that
"goes a long way to make friends"*

Bus operation—and all that goes with it—is a serious business for the Palace Sight-Seeing Company, of New York.

Operating 15 big Mack busses like the seven pictured on this page, its owners must keep close tab on every item that enters into operating costs—or the year's end would show a sad red balance on the books instead of a happy black one.

And so Palace officials buy tires on the dollars-and-cents basis of performance as revealed by this company's cost sheets and accounting records. It was the performance of Generals in side-by-side service

with other makes on Palace busses that led this firm to standardize on Generals exclusively.

These side-by-side tests proved that Generals out-travel all competition by a wide margin; that Generals cushion the mechanism of the bus against the jolts and jars of the road; that Generals bring a substantial yearly saving in power and gasoline consumption.

Combined, these General advantages mean the lowest possible tire cost per mile and the lowest cost of operation—the very things Palace officials and all other fleet operators want.



The

GENERAL TIRE

—goes a long way to make friends

BUILT IN AKRON, OHIO, BY THE GENERAL TIRE AND RUBBER CO.



When Spindletop—first gusher oil field in America—staged a comeback recently and production jumped almost over night from 1,300 barrels a day to approximately 100,000, the Eastern Texas Electric Company, Beaumont, Tex., took care of transportation needs. The picture shows one of two buses operating between city and field, a distance of four miles, on half-hourly headway. Although a number of “independents” are operating nondescript touring cars in competition at reduced fares, riders are showing a marked preference for regular service maintained by the established utility. (Reprinted from AERA, October 1926).

“ . . . Marked Preference for Regular Service . . . ”

—and operators in all sections are constantly finding a wider range of utility for Graham Brothers Motor Coaches. They are medium capacity, fast, comfortable, good-looking and dependable. Quick service is obtainable from Dodge Brothers Dealers everywhere.

Prices—21-Passenger Street Car Type, Complete, \$3815;

12-Passenger Parlor Coach, \$3750

f. o. b. Detroit

GRAHAM BROTHERS MOTOR COACHES

SOLD BY DODGE BROTHERS DEALERS EVERYWHERE



THE very fact that Budd-Michelin Wheels were ready before the first bus and have carried the bus industry to its present stage of development, tells the whole story better than we can tell it here.

BUDD
WHEEL COMPANY

Detroit



The electrical generation

WE LIVE in the electrical age. The most loved possession of the small boy is his electric train. The most faithful servants of the American woman are her electric appliances. The most economical power for man's great industrial plants is the electric power generated by central stations.

The key to the smooth, continuous functioning of every one is a strand of copper wire. Under the surface of a multitude of these toys, appliances, and huge generators lies Rome Magnet Wire.

For throughout industry you will find a growing preference, for Rome Magnet Wire, and for all Rome Wires. There is in these Rome products a desirable quality, brought by complete manufacture, supervision, and inspection in the Rome mills—from wire bar to finished copper wire.

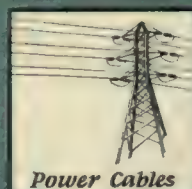
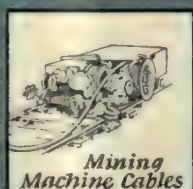
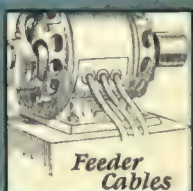
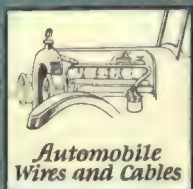
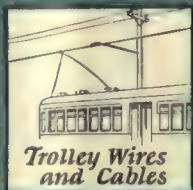
Rome Service—ample stocks and competitive prices—are at your disposal, while an opportunity to quote on any of your wire requirements will always be welcome.

ROME WIRE COMPANY, ROME, N.Y.

ROME WIRE

FROM WIRE BAR TO FINISHED COPPER WIRE

Single Cotton
Enameled
Magnet Wire



BECAUSE of its small outside diameter, Rome Enameled Magnet Wire is increasing in popularity every year. Particularly is this true with the manufacturers of the smaller types of electrical equipment.

Perfected by a research department that is constantly investigating and analyzing—backed by twenty years of manufacturing experience—there is small wonder that this, and all Rome wires are appreciated by their users.

If you will let us know what wires you are interested in, we will be glad to send you samples, catalogs and other information that will be of help. To those who have a particularly difficult wiring problem, we offer the advice of our Engineering Department.



ROME WIRE COMPANY

Mills and Executive Offices: ROME, N.Y.

Diamond Branch: Buffalo, N.Y.

New York—50 Church Street

Boston—1011 Little Building

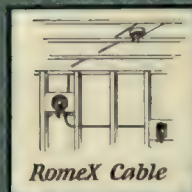
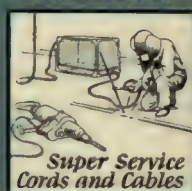
Detroit—25 Parsons Street

Los Angeles—J. G. Pomeroy, Inc., 336 Azusa Street

San Francisco—J. G. Pomeroy, Inc., 960 Folsom Street

Chicago—14 E. Jackson Blvd.

Cleveland—1200 W. 9th Street



100 · YEARS · OF · MANUFACTURING · EXPERIENCE ·

Snow Sweeper
Hattan and Car
Seat Webbing may
be ordered through
any H-W Sales
Office.



H-W Seats Chosen After Practical Test

TO offset the inroads made by busses, a midwestern Electric Railway Company (name on request) determined to increase the attractiveness and comfort of its cars.

Sample cars, equipped by three seat manufacturers, were operated in a six months' practical service test.

The above installation of Heywood-Wakefield seat No. 55-P, without arm rests and with attractive grip rail, was selected by the public and the railway company as the most handsome, comfortable and practical.

Car-seating experts, fortified by our 100 years of seat-building experience, will help in selecting the seats best suited to your needs. This service is free, without any obligation, through any H-W sales office.



Seat No. 55-P may be had with arm rests, special grip rail or other features according to the character of the installation.

Heywood-Wakefield

REG. U.S. PAT. OFF.

HEYWOOD-WAKEFIELD SALES OFFICES

Heywood-Wakefield Company, Wakefield, Mass.

The G. F. Cotter Supply Co.,

Houston, Texas

Heywood-Wakefield Company,

439 Railway Exchange Bldg., Chicago, Ill.

Heywood-Wakefield Company,
516 West 34th St., New York, N. Y.
Herbert G. Cook,
Hobart Bldg., San Francisco, Cal.

Frank N. Grigg,
630 Louisiana Ave., Washington, D. C.
Railway & Power Engineering Corporation,
133 Eastern Ave., Toronto;
Montreal; Winnipeg, Canada



The Battery That Never Had a Chance

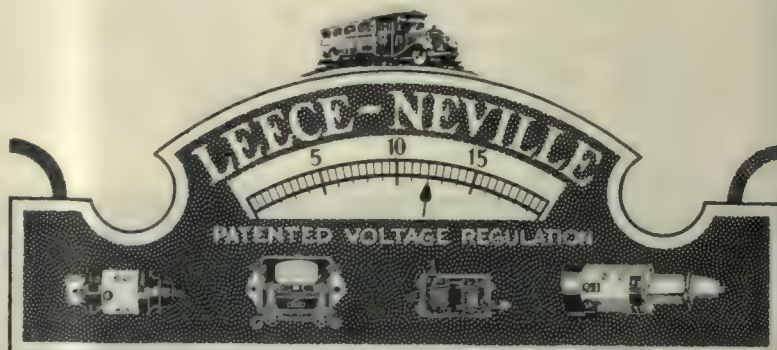
He was a good battery, too—made right by a high grade manufacturer—every reason why he should have given long, efficient service.

But he never had a chance. Over charging—continued undercharge—broke him down—now look at him—junk—and so young, too. Replacing him costs good money.

Bus batteries are made for long service, if you give them a chance. Leece-Neville Patented Voltage Regulation prevents the things which no battery can stand. And they respond with several times the service—last years instead of months.

If your buses do not have Leece-Neville Patented Regulation, your batteries aren't getting a chance—better let us tell you how it can be installed.

Most bus makers either install it, or provide a place for it.



The Leece-Neville Company

5353 Hamilton Ave., Cleveland, Ohio



Laura Stewart and her Jazz Pirates will tour the circuit in this modern style. This International Harvester 6-cylinder Club Coach replaces two automobiles and a light truck. The rear seats have been removed to provide accommodation for luggage and instruments. Great savings are effected and the party is kept pleasantly together.

INTERNATIONAL HARVESTER 6-Cylinder Coaches • • for 15 and 17 Passengers

THE riding comfort and luxury details that appeal to these sophisticated travelers, and the economies that sold Miss Stewart's management, are features of the International Club Coach.

The attractive design of the body is another point of popularity. Mechanical refinement and performance are unsurpassed.

International Harvester builds this long low 6-cylinder chassis to fit the demand for a quality motor coach at low cost. The 15-passenger Club Coach and the

17-passenger Sedan-type Coach are both provided for this speedy chassis. International Harvester manufacturing facilities make the low price, and Harvester automotive experience (22 years) assures low maintenance and long mileage.

SERVICE is rendered International Coaches from our 122 Company-owned branches over the United States.

Build patronage and profit for your routes with International Harvester 6-cylinder Coaches. See the nearest branch or write us.

INTERNATIONAL HARVESTER COMPANY
606 So. Michigan Ave. OF AMERICA Chicago, Illinois
(Incorporated)



Ten people ride in the coach; Miss Stewart stands fourth from right.

FISK TRANSPORTATION "Fillerless" CORDS

Blood Will Tell

A saying that is as applicable to a tire as to a human being. If a tire is made of the best materials it proves it in long wear—high mileage—under varied conditions. If it is composed of "shoddy" you soon learn of the deception.

Fisk Transportation "Fillerless" Cords are "Red-blooded" tires because they are composed of only high grade material.

The surest way of proving the superiority of these tires is to place one alongside of any other tire and check its mileage.

Fisk Transportation "Fillerless" Cords are in use today by leading bus fleets throughout the country.

The Fisk Tire Company, Inc.
Chicopee Falls, Mass.



Time to
Re-tire
Get a FISK

Trade Mark Reg. U. S. Pat. off.



The illustration shows a 21-Passenger Suburban Body mounted on a White Model 53 chassis with 180" wheelbase.

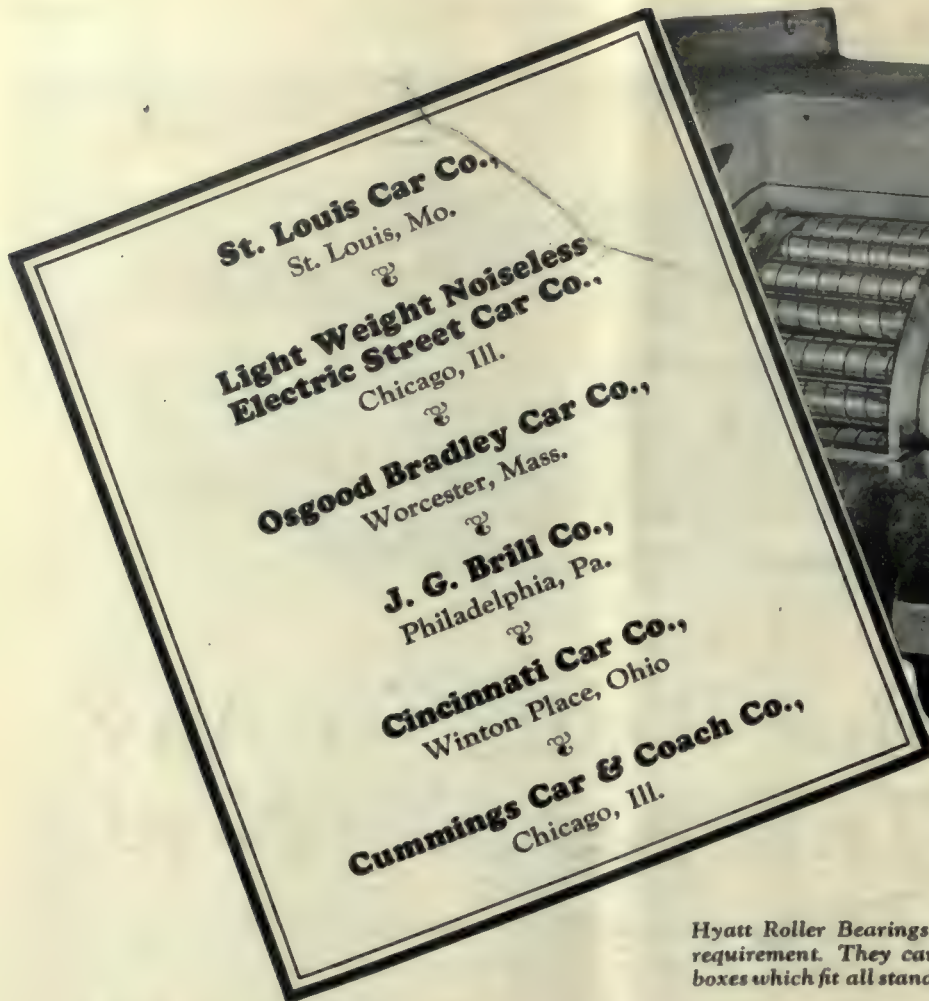
Bus Bodies for Any Transportation Need

THE operator of Baker-Raulang Bus Bodies buys far more than comfortable, attractive buses. He buys bodies specially designed and skillfully built to carry hundreds of thousands of passengers at minimum upkeep cost. And he buys a complete body engineering, sales and manufacturing service, backed by 73 years experience, capable of working with him to solve any bus body problem no matter how complex.

Baker-Raulang improvements, service, experience can be of particular value to the large operator as well as to the smaller user. Baker-Raulang Bus Bodies are made in the City Pay-Enter type, Parlor Chair type and all intervening types to meet special requirements. Catalogue No. 201 illustrates many types and improvements in which every operator should be interested.

THE BAKER-RAULANG COMPANY • Bus Body Division • CLEVELAND, OHIO





Hyatt Roller Bearings meet every A. E. R. A. requirement. They carry full standard loads in boxes which fit all standard trucks without change.

TODAY ~ more than ever before ~ it pays to modernize

Modernization's demands are answered by up-to-date Hyatt equipped journal boxes—furnished, upon request, by the above manufacturers.

Specify Hyatt Quiet Roller Bearings. Your public will confirm your judgment in terms of increased patronage. For with these bearings you can give more comfortable and more quiet rides through smoother starts and quicker pickups. You give them better service through more rigidly maintained schedules.

Tests demonstrate that Hyatts in actual operation save much on power

and lower the peak load demand. Lubrication is necessary only every four or five thousand miles. In other words, your maintenance time is reduced to your regular routine inspection.

Hyatt's record of more than a million and a half car miles—trouble-free, quiet miles—on known properties, suggest that you quickly investigate their advantages.

Any of the above companies—or the Hyatt engineers—wait to serve you.

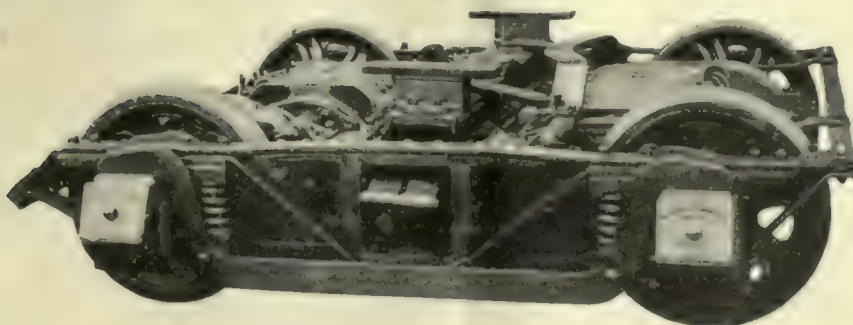
HYATT ROLLER BEARING COMPANY
Newark, New Jersey

HYATT

QUIET ROLLER BEARINGS



Characteristics of the Modern Car



Cummings No. 62 low car body truck for light weight city or interurban cars

Two features of the modern car which are vitally important to attract and hold new business are attractive appearance and comfort. The latter is determined to a great extent by the riding qualities of the trucks. Cars recently built by this company, mounted on Cummings No. 62

Trucks, have evoked much favorable comment because of their smooth riding and quiet operation. The skillfully balanced design of the trucks, which contributes materially to this result, is directly in line with the modern trend in electric transportation.

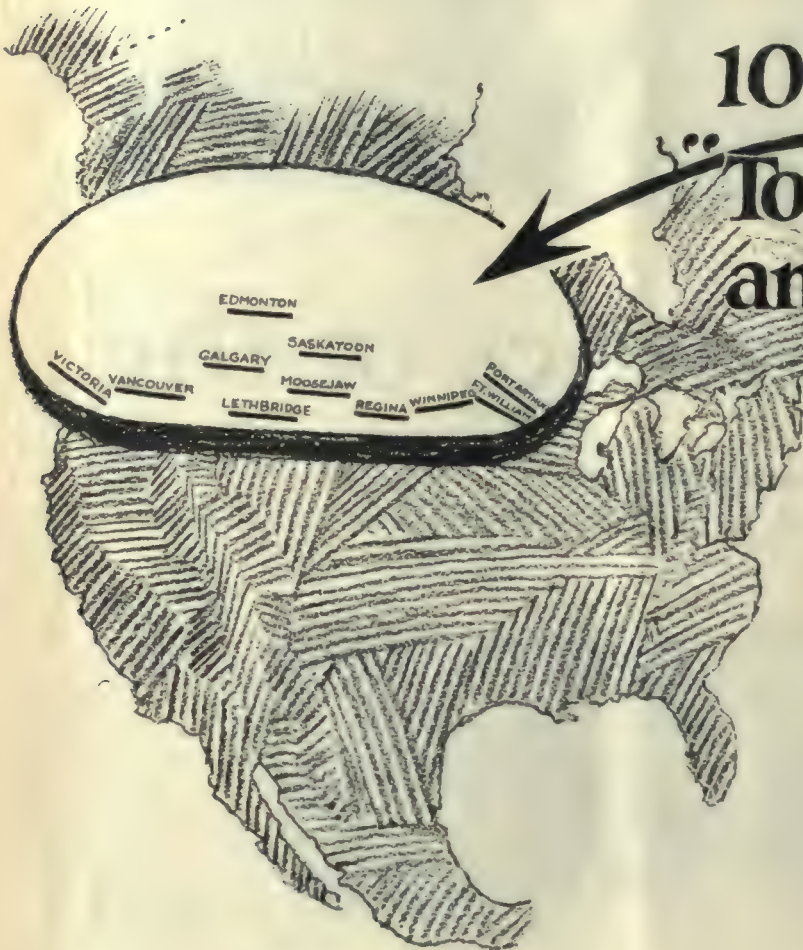
CUMMINGS CAR AND COACH COMPANY

Successor to McGuire-Cummings Mfg. Co.

111 W. Monroe Street, Chicago, Ill.

In Western Canada

100% users of
"Tool Steel" Gears
and Pinions



Winnipeg	Saskatoon
Regina	Port Arthur
Fort William	Brandon
Moose Jaw	Victoria
Lethbridge	Vancouver
Calgary	Edmonton

ABSOLUTELY every Electric Railway line in this progressive territory buys "Tool Steel" Gears and Pinions. Most of them have standardized on "Tool Steel" for years.

Can there be better proof of *Quality Leadership?*

THE TOOL STEEL GEAR
& PINION COMPANY
Cincinnati, Ohio



The Standard of Quality

TOOL-STEEL QUALITY
GEARS AND PINIONS



*Transportation Experience
has Developed a More
Attractive, Economical,
Durable Motor Coach.*



Universal Transportation

Greatest Protection Ever

THE makers of Q. C. F. motor coaches have a background of long experience in building street cars, gas-electric rail cars, passenger cars, freight cars and other types of transportation equipment—and motor coaches are transportation equipment. This broad, pioneer experience with every form of modern transportation underlies the success of Q. C. F. coaches and in large measure of the operators who use them. No finer engineering could enter into a motor coach. No higher responsibility could govern the sale of a single coach or of an entire fleet.

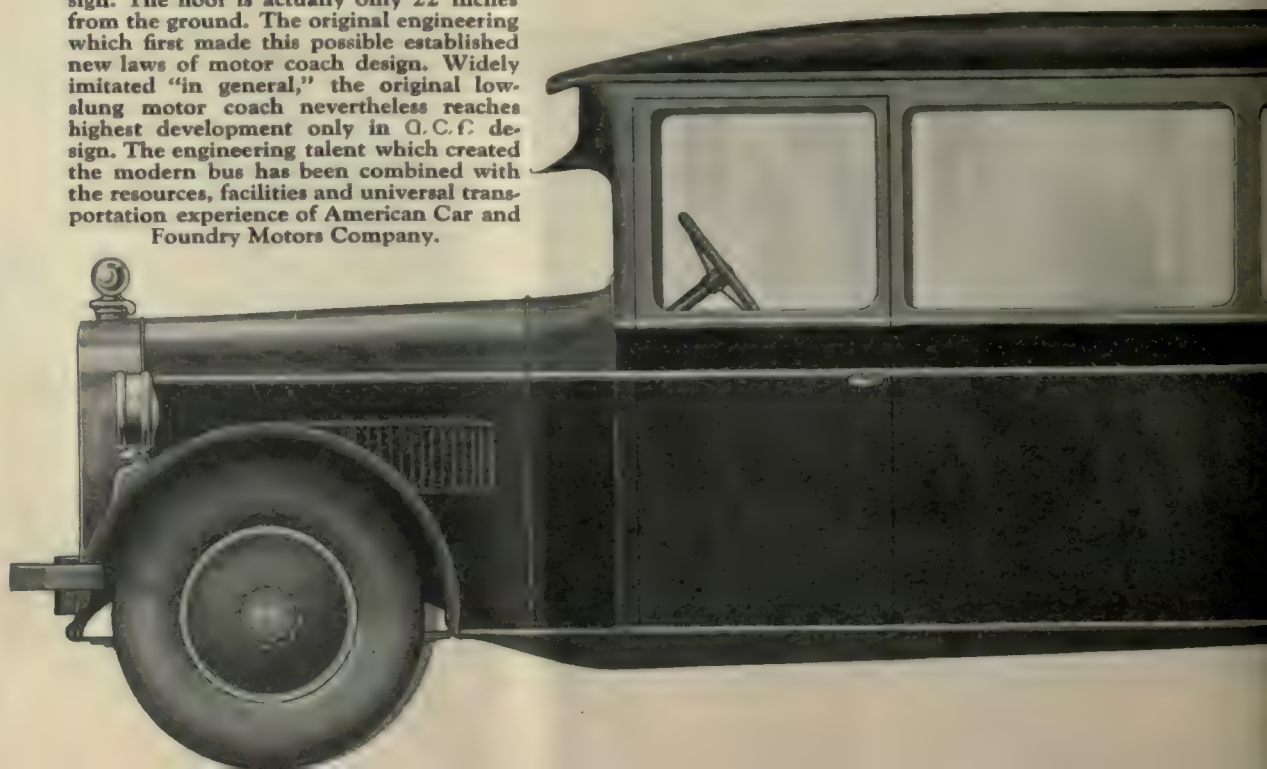
The mature judgment of American Car and Foundry Motors Company is based on universal transportation knowledge and experience. An Q. C. F. survey of any local, inter-city or overland transportation project will be found helpful in revealing the true profit-securing possibilities. Sane, well-considered guidance, and sound, thoroughgoing recommendations from this organization will

help to assure the development of correct operating plans.

Q. C. F. Coaches Are Always Modern

In other respects, also, the purchase of Q. C. F. motor coach equipment carries with it a degree of protection never before possible in this field. First—every Q. C. F. chassis is so designed that it can be kept in finest condition, and completely modernized, by means of the same methods which have long been standard with other types of transportation equipment. Q. C. F. motors, for example, consist of a series of sub-assemblies—the head and valve unit, the cylinder block unit, the crankcase units, etc. If valve grinding is required on any Q. C. F. coach, the complete cylinder head assembly is easily removed and quickly replaced by a spare head, carried on hand. The coach goes out and earns while the valves are being ground! If cylinders should ever need

Surety, sleekness and comfort are more than a matter of appearance in Q. C. F. design. The floor is actually only 22 inches from the ground. The original engineering which first made this possible established new laws of motor coach design. Widely imitated "in general," the original low-slung motor coach nevertheless reaches highest development only in Q. C. F. design. The engineering talent which created the modern bus has been combined with the resources, facilities and universal transportation experience of American Car and Foundry Motors Company.



Experience to Guide You

Available in Coach Buying

regrinding, a new standard cylinder assembly can be installed—perhaps for less than repair operations would cost under other conditions.

The same plan is followed throughout the chassis. Maintenance is thus immensely simplified. And whenever scientific progress brings vital improvements they can often be economically applied to older Q. C. F. coaches by removing the original sub-assembly and installing a new one, made to fit.

Security for Your Investment

Since all sales are controlled directly by American Car and Foundry Motors Company, the buyer has the advantage of dealing direct with the manufacturer, rather than with dealers or agents. And there is a fundamental business asset in the fact that the public always associates Q. C. F. coaches with first-class travel. Every bus operator knows that Q. C. F. coaches do bring this very definite added

asset of public appeal. In designing these Q. C. F. coaches, the experience of hundreds of millions of miles of service in practical city and interurban operations, with the product of companies whose control has been acquired, has been a safe guide in making the most durable and economical motor transportation vehicle yet produced.

Today Q. C. F. coaches, developed from this basic experience, are ahead in safety, comfort, ruggedness, surety, power and economy. Whole fleets are being changed to an Q. C. F. basis, once a single Q. C. F. coach is put into service. Q. C. F. coaches are also being specified on some of the biggest new equipment orders in bus history. Always, every operator benefits by the complete transportation knowledge which is available through American Car and Foundry Motors Company. Its resources, responsibility and practical knowledge are the soundest form of security for every investment in Q. C. F. equipment.



Performance That Meets

These Coaches are developed from

TESTS by others are the proof of Q. C. F. value. Q. C. F. records and other data come not only from level city asphalt, but from cobbled hills and transcontinental highways as well. Both the multi-stop congestion of cities and the fastest overland tours are testing Q. C. F. coaches every day. Interurban lines, mountain stage routes, city schedules and all other forms of bus service have long been piling up the evidence on Q. C. F. coaches.

Proof Not Based on Favorable Conditions Only

Whatever the type of service expected, there are Q. C. F. coaches somewhere, already extensively making good, in com-

parable work. There are economy records obtained under the most severely competitive conditions. There are repeat orders based on nothing but direct profit to Q. C. F. operators. Complete adaptability to every requirement is assured, for Q. C. F. coaches have always returned extraordinary profits in *all* service, under the widest range of management policies.

Public Confidence Gained and Retained

The very appearance of Q. C. F. coaches assures an instant impression of safety, comfort and smartness. Public confidence is captured and a receptive mood is created, which builds business. This

Q. C. F. body design provides the most inviting visibility and airiness. Attractively open or snugly enclosed, there is silence, comfort, luxury. Lighting and heating are adequate. Appointments inside and outside are complete. Extremely smooth driving and riding qualities banish fatigue and build business.



Your Requirements First

Experience with ALL Transportation



Passenger comfort, and economical operation as well, depend very largely on driver efficiency. Perfected control and extreme visibility foster safe, interested, proper operation. One-man or two-man operation can be provided for. All legal regulations are met in every respect, without sacrificing operators' interests.

good will is retained by fast, frequent, smooth, silent service, made possible by the low, swayless suspension and agile, powerful motors.

Like the mechanical units of the chassis, Q. C. F. bodies can be perfectly maintained with minimum expense and effort. Durable but attractive finishes and fittings are used throughout. Cleanliness, ventilation and lighting have all had the most thorough study. For it was Q. C. F. principles which first banished truck-type bus service.

Today Q. C. F. coaches are more than ever to be depended upon for the fea-

tures which win and hold business through sheer excellence, while returning the greatest possible margin of profit under all conditions.

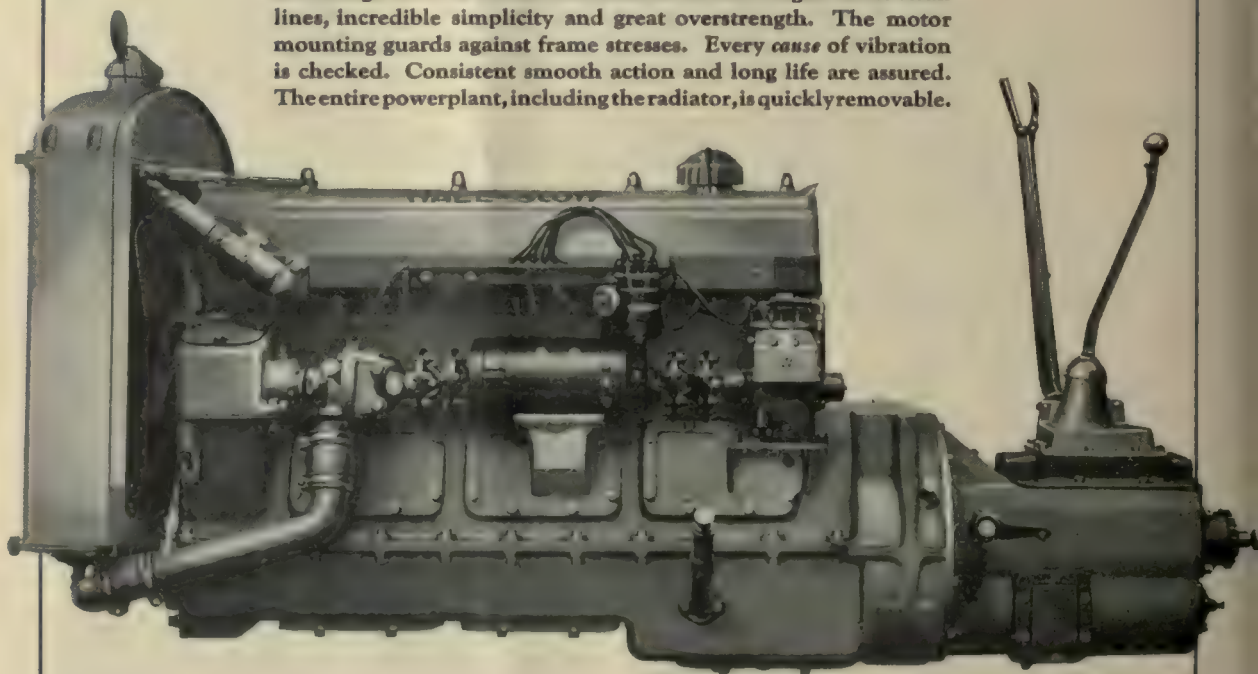
Years of Extra Mileage at No Extra Cost

As with all the transportation equipment built by Q. C. F., these coaches are made to meet exacting schedules faultlessly—both in maintenance and in operation. Every unit and every detail of chassis and body are developed to return thousands of profitable passenger miles long after first cost is written off.

Peak Torque at only 1000

Inherent Power makes these Coaches Lively

Q. C. C. motors, like the bus itself, suggest power, capability and refinement in their very appearance. The six-cylinder motors develop 90 h. p. The four-cylinder motors develop 60 h. p. Scientific design and use of the best materials have brought about clean lines, incredible simplicity and great overstrength. The motor mounting guards against frame stresses. Every cause of vibration is checked. Consistent smooth action and long life are assured. The entire powerplant, including the radiator, is quickly removable.



LIKE the entire coach chassis, the Q. C. C. Hall-Scott engine was designed specifically for motor coach work. Flexibility and acceleration compare with the best passenger car performance, without sacrificing durability or economy. The scientific achievements in this engine are revealed in the torque and output curves. Torque peaks at only 1000 R. P. M. in this 90 H. P. six-cylinder Hall-Scott engine. The load is easily handled at low engine speeds, preserving the motor.

Hall-Scott motors invariably pile up their 50,000 or 100,000 miles, before anything but simplest routine attention is required. This will be recognized as typical of Hall-Scott motors, long ranked among the finest in the world. Many of the most advanced principles of balance, carburetion, combustion economy, valve drive and lubrication originated in the Hall-Scott engine.

Maintenance on Scientific Basis

Development has been carried to the point where there is literally nothing "inside" of these engines but the crankshaft, rods and pistons! The entire valve mechanism, including the camshaft, is carried by the detachable head. The cylinder block is a single smooth unit, so simple that, despite costly material, it can be replaced entirely when it reaches the regrinding stage. The crankshaft is the hardest alloy steel shaft used commercially—regrinding is virtually never required. The Q. C. C. radiator mounts on the motor base, eliminating all trouble from frame-mounting.

A whole array of such exclusive engineering principles and details assures more mileage from every gallon of gasoline and oil; from every hour of labor. With all its technical refinement the Q. C. C. Hall-Scott motor remains simple

R. P. M.—Sure Economy and Fast while the Engine "Takes It Easy"

and rugged. Not a single part or function requires specialized care such as is needed for many other types of motors which are often less accessible, difficult to lubricate, and subject to higher friction and combustion losses.

Chassis Also Highly Advanced

Unit-mounted with the Q. C. F. Hall-Scott engine are the multiple-disc clutch and the four-speed transmission. The arrangement of engine accessories is clean, compact and accessible.

The whole Q. C. F. chassis is on a par

with this highly refined power plant. Q. C. F. design reflects the experience gained from millions of miles of successful passenger transportation by Q. C. F. coaches. The assurance of smooth, quiet, comfortable, safe travel which sells Q. C. F. coaches to the greatest operators also sells the motor coach *idea* to the public.

In addition to their engineering excellence and established low-cost operating records, Q. C. F. coaches always bring this one undeniable advantage—**PEOPLE LIKE TO RIDE IN THEM.**

Gas and Gas-Electric

Body and Chassis Types for All Service

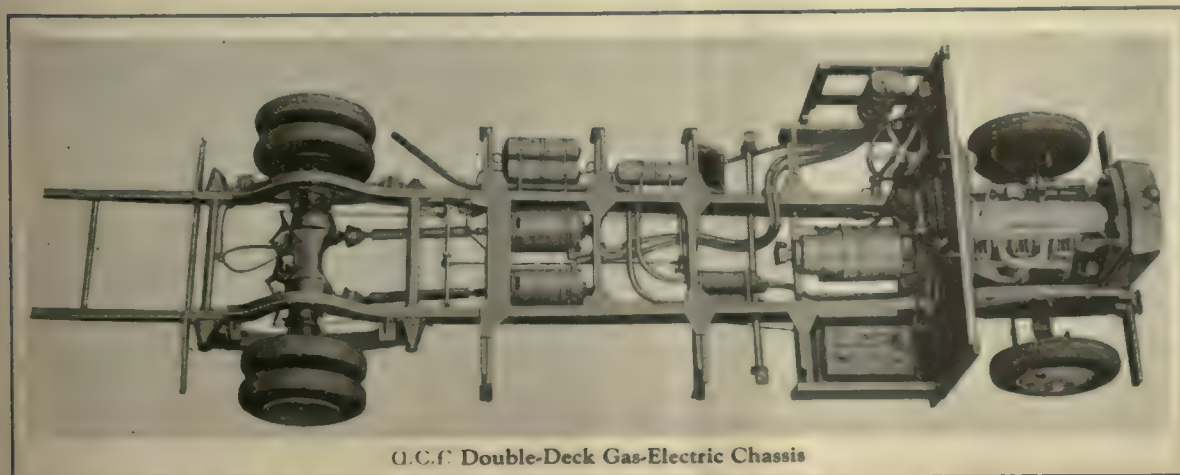
NOTED particularly for development of the motor coach parlor car, Q. C. F. also builds buses of the street car type, both gas and gas-electric.

The decided advantages of electric final drive, in multi-stop operation especially, are already largely accepted. Q. C. F. gas-electrics occupy a peculiarly favorable position, because Q. C. F. practice so largely offsets any tendency toward weight and complication in gas-electric layouts. The combined engineering effort of General Electric and American Car and Foundry could hardly

have produced anything but a highly advanced type of vehicle.

The suitability of gas-electric or gasoline chassis with any body styles will be analyzed in detail upon request. The Q. C. F. Transportation Staff will gladly serve any bus operator, regardless of the size of operations, or the type of equipment now in use.

Benefit by this broad constructive policy. Draw upon the universal transportation experience of American Car and Foundry Motors Company.



Q.C.F. Double-Deck Gas-Electric Chassis

The 31 Passenger Street Car Type



No.
900-D

Latest type double chair

This 900-D double chair is the newest of the long line of H-K seats for modern transportation. It represents the very height of luxury. Shown above is the single-end car type. For double-end cars the chair has another arm and a rotating base. Upholstered in leather or fabric, the 900-D has air and spring cushion pads. Each pad is separate, but an ingenious attachment prevents their promiscuous removal.

With slight modifications this type is made for buses also.

Further particulars on request.

HALE-KILBURN COMPANY

General Offices and Works: 1800 Lehigh Avenue, Philadelphia

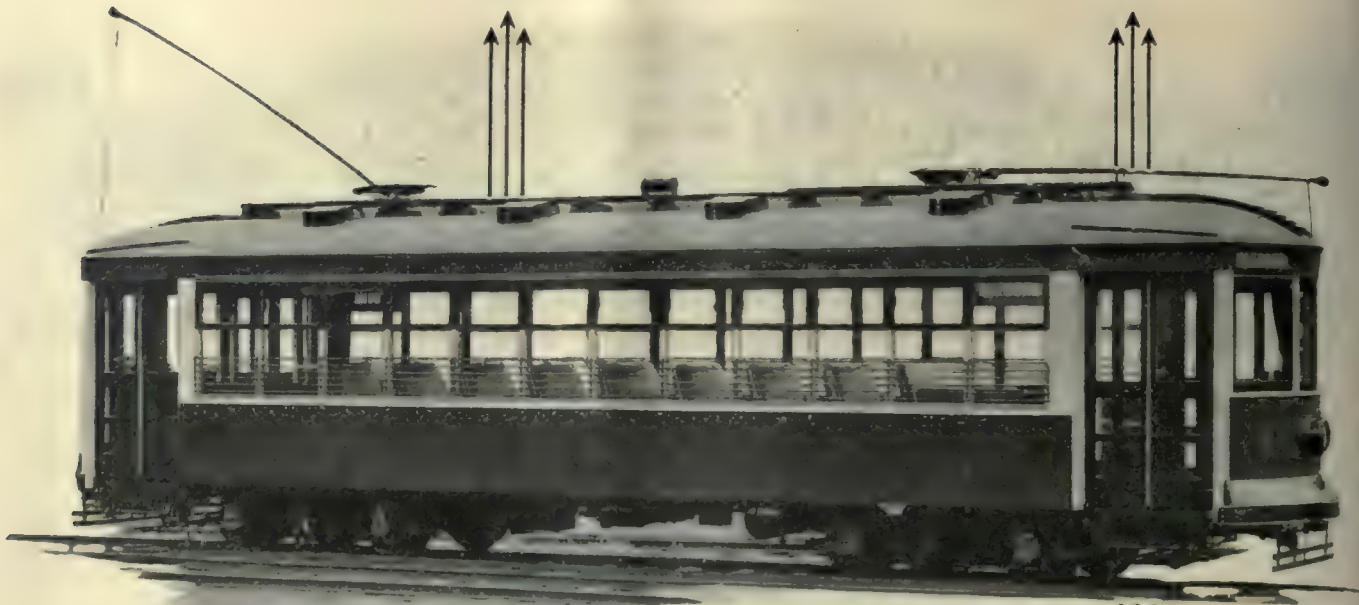
SALES OFFICES:

Hale-Kilburn Co., 30 Church St., New York
Hale-Kilburn Co., McCormick Bldg., Chicago
E. A. Thornwell, Candler Bldg., Atlanta

Frank F. Bodler, 903 Monadnock Bldg.,
San Francisco
Chris Eddies, 320 S. San Pedro St., Los Angeles
T. C. Coleman & Son, Starks Bldg., Louisville

W. L. Jeffries, Jr., Mutual Bldg., Richmond
W. D. Jenkins, Praetorian Bldg., Dallas, Texas
W. D. Jenkins, Carter Bldg., Houston, Texas
H. M. Euler, 46 Front St., Portland, Oregon

Hale and Kilburn SEATS



ALTOONA

This car of the Altoona & Logan Valley Electric Railway Company is equipped with our rolled steel wheels.



Rolled Steel Wheels
Quenched and Tempered
Carbon Steel Axles
Armature Shafts
Coil and Elliptic Springs

STANDARD STEEL

WORKS COMPANY

PHILADELPHIA, PA.

BRANCH OFFICES:

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WORKS: BURNHAM, PA.



Muskegon's new cars are "Quality Cars" indeed

Unusually Attractive Cars Recently Shipped to Michigan Railway

THE public of Muskegon, Michigan, will find it hard indeed to resist the appeal of the new cars recently shipped to that city from the "Quality Shops" of the St. Louis Car Co. Built for double end, one-man operation, the smaller doors are arranged as exits, and can be equipped with step treadles if desired. St. Louis Car Co. R50 reversible spring rattan seats, accommodating forty-eight passengers, contribute to an attractive interior.

Painting is a feature. Side

panels of fawn grey, trimming in red, with blue upper sash, and white dashes make a strikingly unusual and pleasing appearance. Experience on this line shows the effectiveness of the white dash in attracting attention, and gaining a clear track. Cars are 44 ft.

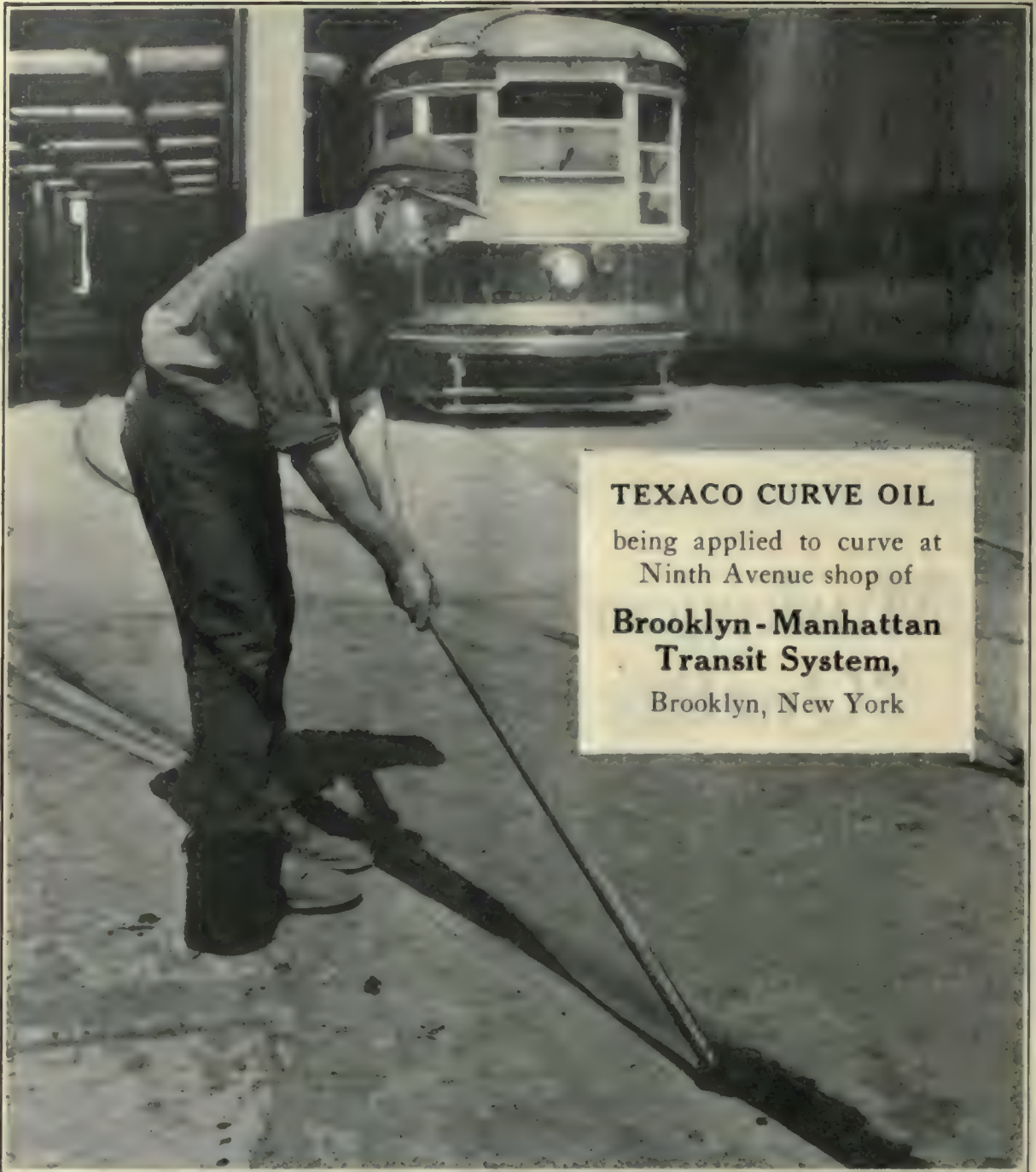
10 in. long over bumpers, 29 ft. 9 in. over body corner posts, mounted on St. Louis EIB-58 trucks with quadruple 25-hp. motors and weigh, complete, 32,000 lbs. Safety Devices are equipped.

St. Louis built
"Quality Cars"
meet the demands of a
Discriminating Public

for further particulars, write

St. Louis Car Company
St. Louis, Mo.

"The Birthplace of the Safety Car"

**TEXACO CURVE OIL**

being applied to curve at
Ninth Avenue shop of

**Brooklyn-Manhattan
Transit System,**

Brooklyn, New York

TEXACO



The Chosen Lubricant
of **ELECTRIC RAILWAYS**



The Texas Company, U. S. A., 17 Battery Place, New York City
OFFICES IN PRINCIPAL CITIES

EMPIRE BOLTS & NUTS



A Perfect Bolt for Every Purpose

Empire Bolts are the result of eighty-one years' concentration on the production of just one line—bolts, nuts and rivets.

Coincident with the building of the largest volume of business in America has gone the constant improvement of the product. The house of Russell, Burdsall and Ward has pioneered in practically every improvement in the manufacture of bolts, nuts and rivets, most of the machinery for these improvements being the inventions of our own executives or their engineers. The unbe-

lievably accurate Empire New Process bolt thread is an example of this constant bettering of the product.

Bolts of exceptional quality for every purpose and in any quantity—that is what the name Empire stands for.

RUSSELL, BURDSALL & WARD **◎ BOLT & NUT COMPANY ◎** PORT CHESTER, N.Y.

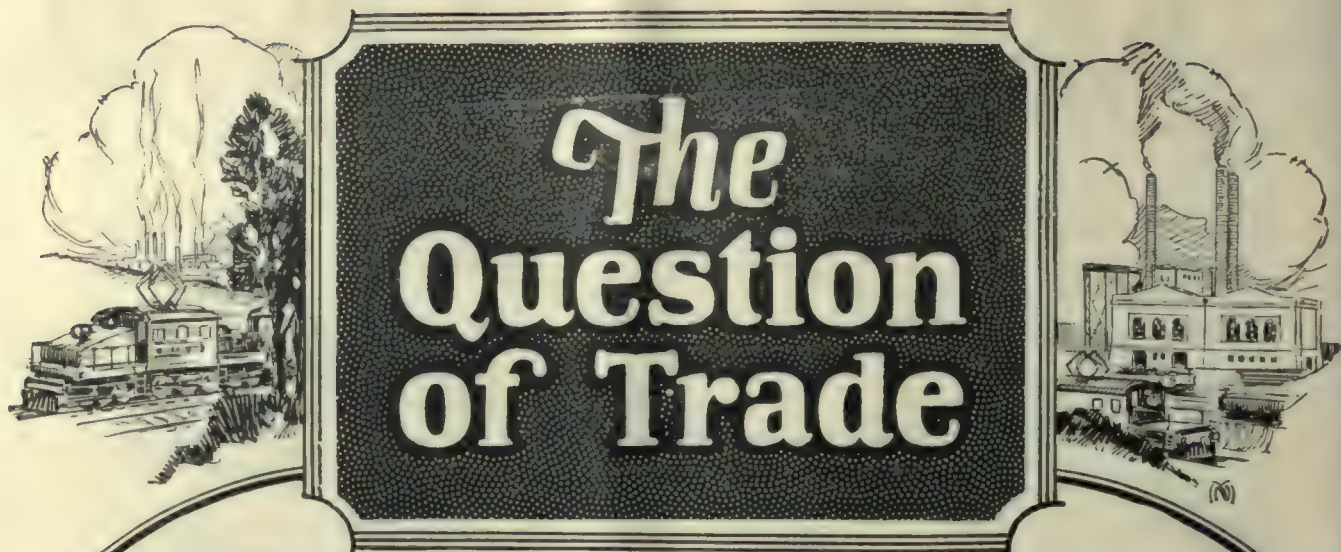
Branch Office Stevens Building CHICAGO	Branch Office General Motors Bldg. DETROIT	Branch Factory 165 Jackson Street ROCK FALLS, ILL.	Branches & Offices 165 Jackson Street SEATTLE	Marshall & Marshall, Inc. 115-117 Broadway Street SAN FRANCISCO
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Makers of Bolts, Nuts and Rivets Since 1835

THE PRODUCT OF THREE



GENERATIONS OF BOLT MAKERS



IN SELECTING oils and greases for your machinery, care should be taken to choose those which are best suited to the machinery in your plant. Lubricants should be selected according to the work they will have to do and the wear they will have to endure, just as the manufacturer of a machine uses steel in one place, cast iron in another and bronze in still another.

Lubricants should not be chosen from the standpoint of viscosity alone. The suitability of the oil or grease to the running speed of the machine, the bearing pressure, and the heat under which the machine operates must also be considered. In some cases, where the lubricants are exposed to acid or salt water, special care must be taken to select oils or greases which will resist the action of these agents.

Standard Oils and Greases

are made in a wide variety of grades to meet the requirements of all machinery now used in the industrial world. For your own protection, it is advisable for you to have the aid of the Standard Oil Company (Indiana) representative, who is competent to tell you which grades will give the best results under the conditions present in your plant.

STANDARD OIL COMPANY
(INDIANA)

910 South Michigan Avenue

Chicago, Illinois





SAFETY

Illustration shows International Creosoted Pine Poles in service of the Oklahoma Gas & Electric Co. (Byllesby Property.)



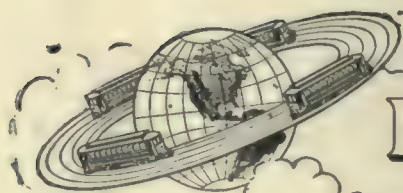
Everything Okeh after the Storm

IT'S A GRAND and glorious feeling—after a severe storm to know your pole line is intact and everything is safe and sound. Previous storms have demonstrated conclusively that Creosoted Pine Poles give the greatest protection against monetary loss and service interruptions during raging storms. Why? Because Southern Yellow Pine is 44% stronger than the nearest other pole specie—and when creosoted this great strength remains permanent during long service

International Creosoting & Construction Co.
Galveston—Texarkana—Beaumont

International
CREOSOTED YELLOW PINE POLES

The creation and maintenance of car advertising space values requires the same degree of highly specialized knowledge as the construction and maintenance of railroads. Such tasks should be delegated only to those of widest experience and longest record of success.



Barron G. Collier

INCORPORATED

CANDLER BLDG. NEW YORK

Fine Architecture is not
limited to buildings ~
*it is also expressed in
Lang Bodies*



LANG BODIES

create new passengers



*One of the many Lang Bodies used by the
Broadway Sightseeing Company
New York City*

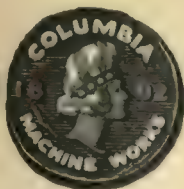
There is never a hint of crowding in Lang Bodies. Where additional capacity is wanted, Lang provides individual adequate folding seats.

Luxurious appointments, that sense of ease which comes from roominess, and a wide range of vision combine to attract and hold an ever-increasing patronage which is constantly seeking the ultimate in riding comfort.

THE LANG BODY COMPANY
CLEVELAND, OHIO



*"After all—
it's the Setting
that counts!"*



Time to Replenish Your Stock of Coils

We're not prophets of the weather but we know that winter snows are close at hand and that winter "shorting" may soon cause a shortage in your stock of coils.

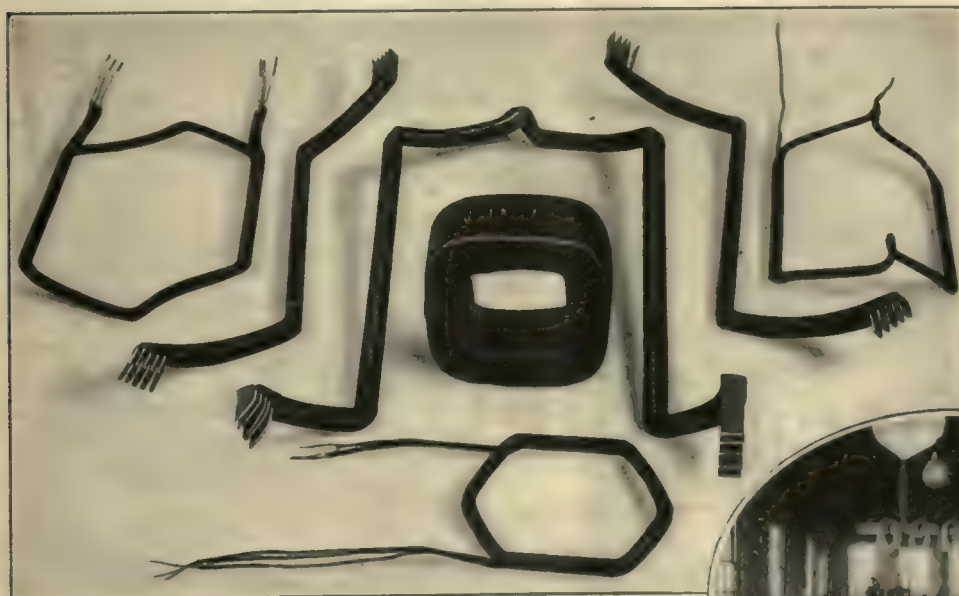
We can also predict that it will be an "open winter" for the motors equipped with Columbia Coils. We know that they are built as all coils *should* be built—on the most modern winding machinery, with the highest grade insulating and reinforcing materials and with accurate dimensions that will fit the slot without pounding or abrasion.

Columbia workmanship, in short, will reduce the "shorting" and eliminate the shortage in your stock of coils. Columbia prices are short of the figure you would normally expect to pay for Columbia quality. Both field and armature coils are standard and interchangeable unless otherwise specified. May we quote you on your spring and winter coil requirements?

The

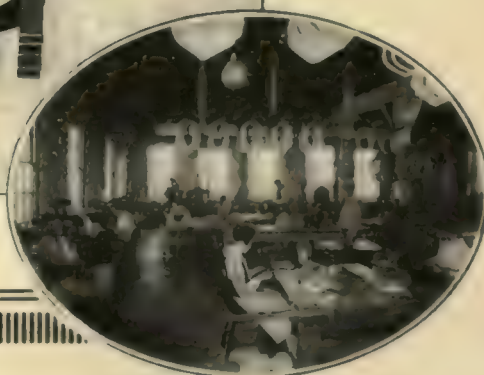
COLUMBIA MACHINE WORKS & M. I. Co.

265 Chestnut St. cor. Atlantic Ave., Brooklyn, N. Y.



RAILWAY SUPPLIES & EQUIPMENT

Machine and Sheet Metal Work, Machinery, Grey Iron and Brass Castings, Patterns, Forgings, Armature and Field Coils



Change places with the INDUSTRIAL BUYER—for a while



SIT in the chair of the real buyer in industry. See industry through his eyes. Study the things which influence him. Run down the sources of his information.

No matter how else he may keep contact with the developments and trends in industry, he is almost certain to place great reliance on the McGraw-Hill publication which speaks for the industry of which he is a part.

What is back of that confidence? Editorial integrity is the foundation of it. Editorial alertness, editorial accuracy, editorial initiative, editorial helpfulness are contributing factors.

When the naval ammunition depot exploded at Lake Denmark, sacrificing lives and millions of dollars of property, two McGraw-Hill publications pointed to fundamental engineering faults which magnified the destruction. Public safety is the first consideration of the engineer and conscientious editors cannot be indifferent to practices that fail to recognize this fundamental.

When Miami was staggering from the effects of a devastating storm, and wild stories were spread of the structural damage done, a McGraw-Hill engineering editor was dispatched to the scene for an accurate report and for lessons in construction which the storm revealed.

When a non-technical business man was appointed Director of the U. S. Reclamation Service, a McGraw-Hill publication gathered and compiled information that proved the need for an experienced engineer in that important position. Other agencies took up the cudgels and an engineer again heads the Reclamation Service.

Another McGraw-Hill publication is stimulating enthusiasm and furnishing helpful suggestions to the electric railway industry which is helping itself by recognizing the modern demand for more attractive and more comfortable streetcar service. Witness, since this cooperative campaign was inaugurated, the staging in Cleveland of the largest

and most enthusiastic electric railway convention held in the history of the industry. It is significant that the greatest single feature of this convention was an exhibit of modern cars by both manufacturer and operator.

With the radio the nation's plaything, and a conflict of the air imminent, a McGraw-Hill publication has made a thorough study of the bills before Congress for control of the air. Out of this study has come staunch support of the one bill which, with amendments, will insure to the radio public continuance of the high class broadcasting which has made the radio a national benefactor and created a new industry.

Fearless, alert, thorough, accurate, often prophetic, these publications voice the sound thinking of their industries. Men of industry welcome them and read them.

On the other hand, it is the same sort of initiative and helpfulness that McGraw-Hill Marketing Counselors manifest in pointing out the need for and the formula by which elimination of waste in selling to industry can be accomplished. This formula, now widely known as the McGraw-Hill Four Principles of Industrial Marketing, embraces the following fundamentals:

- 1—Determination of worthwhile markets
- 2—Analysis of their buying habits
- 3—Determination of direct channels of approach
- 4—Study of effective sales appeals

Any manufacturer may, with benefit, apply these principles to his own selling. Help and data are freely and fully available through the nearest McGraw-Hill office.

Editorial Reader Interest

108 McGraw-Hill staff editors, drawn from industry and trade, know the needs and trends of the fields covered by McGraw-Hill Publications.

These editors are located at 6 strategic centers and travel 700,000 miles a year through industry. In addition more than 1,000 industrial specialists regularly contribute editorial articles on progress and developments in their special fields.

A staff of 467 special news correspondents rounds out a complete editorial service to McGraw-Hill subscribers.

Advertising Reader Interest

107 advertising salesmen, whose first function is to advise on marketing problems, interpret buying habits and buying problems of industry to McGraw-Hill advertisers.

56 seasoned advertising planners, writers and artists, trained in the appeals and mechanics of industrial advertising, cooperate with manufacturers and advertising agencies in making the advertising pages of McGraw-Hill Publications interesting and appealing to the industrial buyer.

McGraw-Hill Publishing Company, Inc., New York, Chicago, Philadelphia, Cleveland, St. Louis, San Francisco, London. PUBLISHERS OF

McGraw-Hill Publications

45,000 ADVERTISING PAGES USED ANNUALLY BY 3,000 MANUFACTURERS TO HELP INDUSTRY BUY MORE EFFECTIVELY

CONSTRUCTION & CIVIL ENGINEERING
ENGINEERING NEWS-RECORD
SUCCESSFUL METHODS

ELECTRICAL
ELECTRICAL WORLD
JOURNAL OF ELECTRICITY
ELECTRICAL MECHANIC

INDUSTRIAL
AMERICAN MACHINIST
CHEMICAL & METALLURGICAL ENGINEERING
POWER

TRANSPORTATION
ELECTRIC RAILWAY JOURNAL
BUS TRANSPORTATION

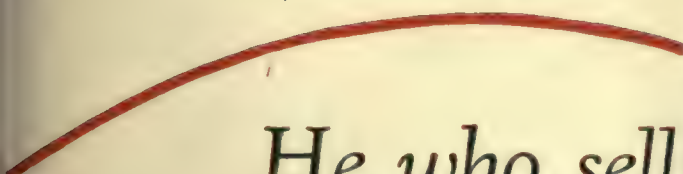
RADIO
RADIO RETAILING

MINING
ENGINEERING & MINING JOURNAL
COAL AGE

OVERSEAS
ENGINEERING INTERNATIONAL
AMERICAN MACHINIST
(EUROPEAN EDITION)

CATALOGS & DIRECTORIES
ELECTRICAL TRADE CATALOG
ELECTRICAL ENGINEERING CATALOG
RADIO TRADE CATALOG
KEYSTONE CATALOG
CENTRAL STATION DIRECTORY
ELECTRIC RAILWAY DIRECTORY
COAL FIELD DIRECTORY
ANALYSIS OF METALLIC AND NON METALLIC
MINING, QUARRYING AND CEMENT INDUSTRIES





He who sells to YOU should seek YOUR viewpoint

The McGraw-Hill advertisement on the opposite page is directed to the management, or selling side of industry—to the man who is selling or trying to sell to you. It has been published in the

New York Times
New York Herald-Tribune
Wall Street Journal
Chicago Journal of Commerce
Boston News Bureau
Finance and Industry
Sales Management
Printers' Ink Monthly
Advertising and Selling

It is reproduced in this McGraw-Hill Publication to let you see how we have appraised your reasons for subscribing to this or some other McGraw-Hill Publication and why you regularly read and use it.

We feel that it is a truthful appraisal of your views as far as it goes. Is this your reaction?

Your comment, together with additional reasons you may have for subscribing to a McGraw-Hill Publication, will be helpful to us, helpful to the industry or business with which you are identified and helpful to the manufacturer who is striving to give you better machinery, materials or appliances.

Publicity Department,
McGraw-Hill Publishing Company, Inc.,
Tenth Avenue at 36th Street,
New York, N. Y.



Annual Statistical Number

January 1, 1927

Facts—

Evidence of the accomplishments of the industry are to the electric railway operator what soundings are to the navigator.

KNOWLEDGE, of what has happened and is to happen through the interpretation of authentic figures, forms the basis of his future plan of operation.

Every year the electric railway operator has turned to the Annual Statistical and Forecast Number (dated January 1, 1927) of *Electric Railway Journal* for the facts that should guide his operations. This important issue will include:

Forecast of the Industry's expenditures
Trends in costs and fares
Total buses purchased by the Industry
Miles of track constructed, re-constructed and extended
Number of cars purchased
Number of receiverships lifted
Reviews of basic tendencies in legal, financial and regulatory matters
Plus a host of other pertinent facts

LOOKED TO and consulted as an authority, to aid in constructive planning the issue is an essential part of the operation of the property.

Because the issue is published at a time when the year's requirements are under discussion, the advertising pages form an important part of the Annual Statistical Number's function.

Today when the greatest buying movement in recent years is in immediate prospect, when railway men are welcoming the help that manufacturers can give in furnishing equipment and parts in tune with the new spirit of management and operation; when inventive and engineering skill are being called on for their best efforts; your message should be directed to this most active market through the Annual Statistical Number.

Write or wire your reservation now. Last forms close December 20. Our copy service department will gladly assist in the preparation of suitable copy.

Electric Railway Journal

Tenth Avenue at 36th Street, New York, N. Y.



VIZABLED G
PATENTED
SAFKAR
TRADE MARK REG
SAFSTEP



Slip-proof, under all conditions, with a foot-gripping surface that is a permanent part of the step.

Miss-proof, because the *Vizabledg* (visible edge) marks each step clearly from those below.

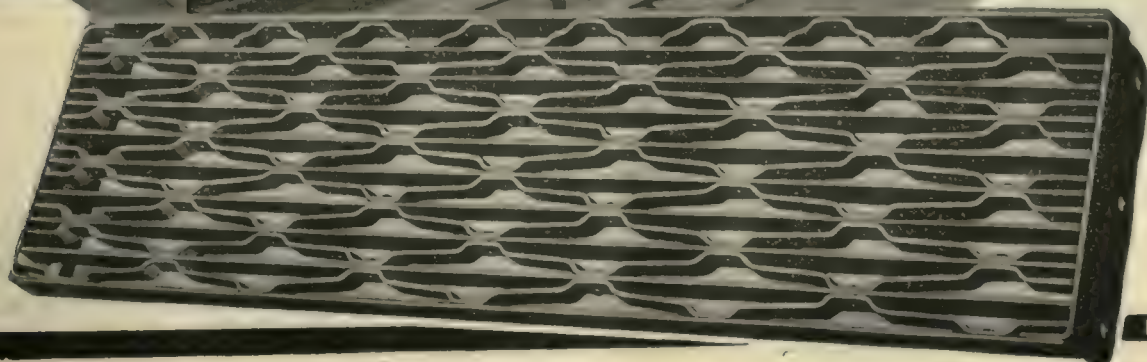
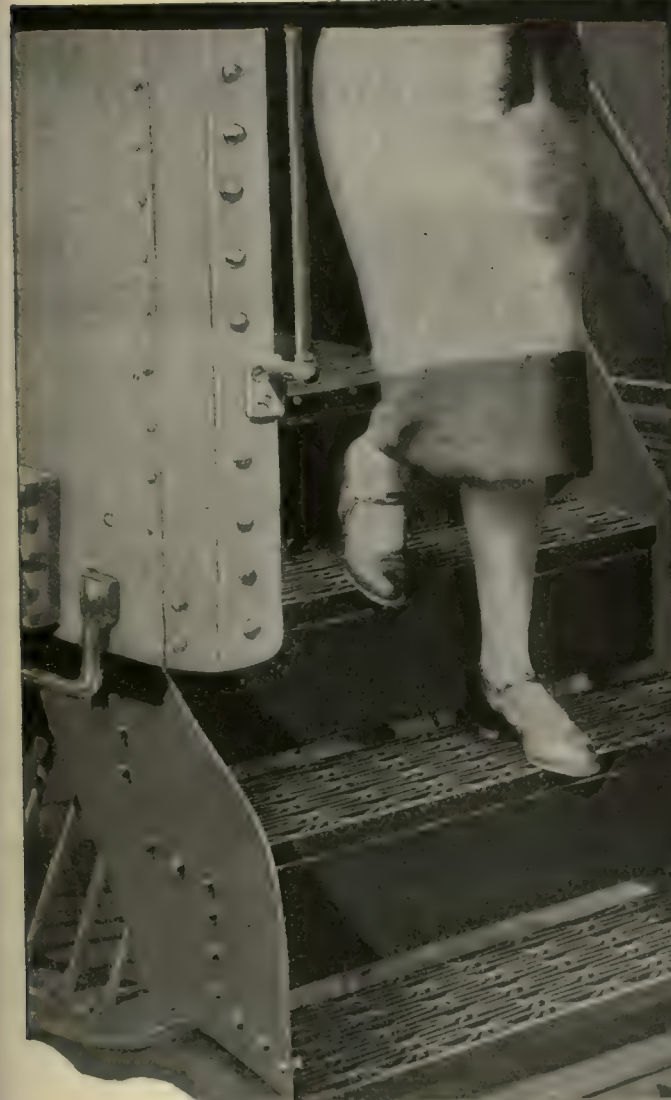
Safe in all weathers, and approved by safety engineers, claim agents and others whose business is safety.

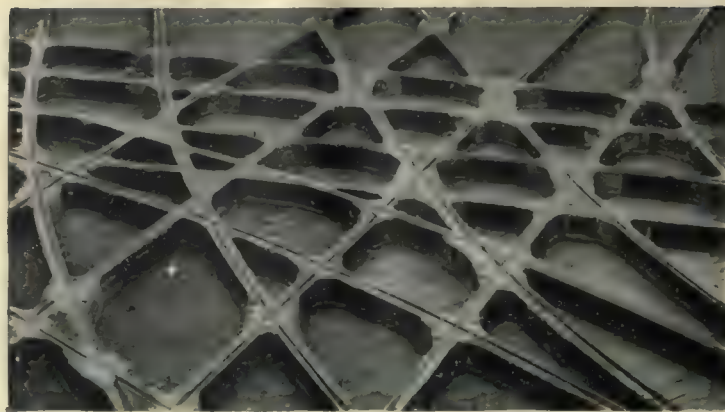
Self-cleaning — a natural foot-scraper, through which dust, dirt, mud, snow, fall and are not tracked in.

Permanent — an all-steel structure needing no maintenance beyond an occasional painting.

Universal — a size and type adapted for any size or type of car and for any service.
Write for Bulletin D-28

IRVING IRON WORKS CO.
LONG ISLAND CITY, N.Y. U.S.A.
Established 1902





Forty-Five Years' Experience and the best of modern facilities are responsible for the excellence of Buda Trackwork

THE BUDA COMPANY

HARVEY, ILL.

Send us
your inquiries



PHOENIX ELECTRIC REFRIGERATOR CARS *Expand Service and Profits*

What new field of service is so easy for your road to develop, and so productive of returns, as that of hauling perishable products?

Equip a car with a Phoenix Electric Refrigerating plant, engage in this service, and you will be surprised at the opportunities for profit it will open up.

The operating of a Phoenix equipped car is a simple matter,—no icing stations, either at terminals or along the line,—no attention required by the train crew,

—no mechanical problems for your shop men.

If more expedient, one of your present freight cars can be converted into an electric refrigerator car with a Phoenix Refrigerating plant. Our Engineering Department will work with you or with any car builder.

Write for full particulars.

The Phoenix Ice Machine Co.
Cleveland, Ohio



Phoenix Transportation
Refrigerating Unit



Motor and Generator BRUSHES



Brushes that Wear

Worn Brushes are a source of continuous trouble and annoyance on car motors. They decrease operating efficiency, cause unnecessary shutdowns and increase maintenance charges. Increase the intervals between renewals by installing U. S. G. Brushes. There are brushes of the exact grade and type for your requirement in our complete line.

*Write for the
brush catalog.*



The United States Graphite Co.
Saginaw, Michigan

New York Philadelphia Pittsburgh Chicago
St. Louis San Francisco

Shuler Front Axles



For Motor Busses

One You CAN Forget

When you select the proper
FRONT AXLE YOU WILL
HAVE ONE UNIT THAT
YOU CAN FORGET.

There is no profit in the use of any unit that makes a one-year carrier and when you get right down to making a decision for long-life Motor-Busses — just bear in mind that we manufacture FRONT AXLES ONLY.

Shuler Axle Co.

INCORPORATED

LOUISVILLE, KY.

Member of Motor Truck Industries, Inc., of America

SERVICE PLUS!!!

PROMPT shipment of H. B. Life Guard parts from a large stock always on hand, PLUS best materials and workmanship. You can depend upon each individual part furnished by the Consolidated Car Fender Company to give the same satisfactory service for which their H. B. Life Guards have been famous for so many years. "A chain is only as strong as its weakest link" and this is also true of a life guard, which should be ruggedly constructed of sound materials to insure dependability and low maintenance costs. It is shortsighted policy to use any makeshift parts on so important a part of a car as a life guard. ORDER YOUR H.B.LIFE GUARDS AND PARTS FROM

THE CONSOLIDATED CAR FENDER COMPANY
PROVIDENCE, R. I.

Wendell & MacDuffie Co., General Sales Agents
110 East 42nd St., New York, N. Y.

Study the Advantages of this Transfer

THE GLOBE TICKET COMPANY PHILADELPHIA		THE GLOBE TICKET COMPANY NEW YORK	
The Community Traction Co. THIS TRANSFER IS ISSUED AND ACCEPTED SUBJECT TO CONDITIONS ON REVERSE SIDE			
C-K 019670		INBOUND SPECIAL FREE TRANSFER	
GOOD INBOUND ONLY FROM BUS OR TRIPPER TRANSFERRING TO LINE PUNCHED			
3 AM THE GLOBE TICKET COMPANY PHILADELPHIA	6 AM THE GLOBE TICKET COMPANY PHILADELPHIA	7 AM THE GLOBE TICKET COMPANY PHILADELPHIA	8 AM THE GLOBE TICKET COMPANY PHILADELPHIA
9 AM THE GLOBE TICKET COMPANY PHILADELPHIA	10 AM THE GLOBE TICKET COMPANY PHILADELPHIA	11 AM THE GLOBE TICKET COMPANY PHILADELPHIA	12 NOON THE GLOBE TICKET COMPANY PHILADELPHIA
LINE 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 100			

The Time Limit Feature

1. No Punching.
2. Expired limit detected by length of ticket.
3. No possibility of confusing A.M. and P.M. as contrasting colors are used.

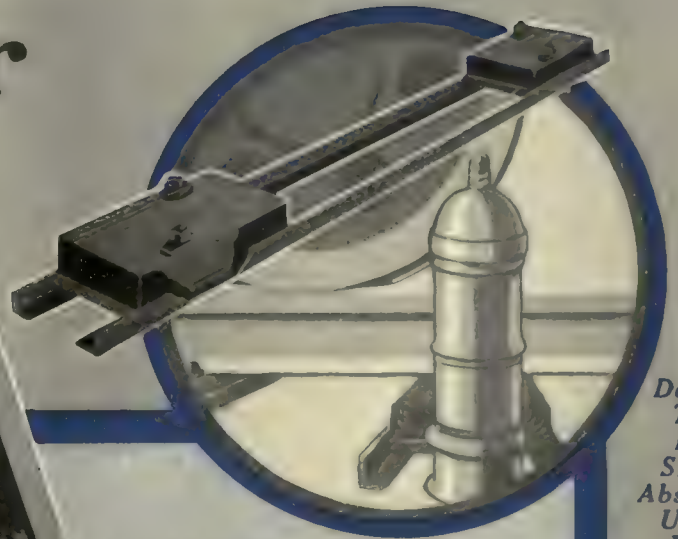
The Date Feature

1. No punching or notching.
2. Indicated by letters and figures, varied at pleasure.
3. No wasted transfers.

Globe Ticket Company 116 N. 12th St. Philadelphia, Pa.

Specialists in Tickets and Checks Since 1873 Los Angeles New York San Francisco

Track on Dayton Ties Stood Up~ The Other Failed



*Dayton
Ties
Put
Shock
Absorber
Under
Your
Track*

*Track Laid on
Dayton Ties
After Four
Years' Extremely
Heavy Traffic*

*Track Laid on Other
Ties Subject to Same
Traffic—After Four
Years*

*Photos of Chicago,
So. Bend & No. Indiana
Track*



Dayton Ties Themselves Wrote This Advertisement



Four years ago the Chicago South Bend and Northern Indiana Railway installed a stretch of track on Dayton Ties.

Four years of the heaviest possible traffic—including loaded coal cars—did not produce a sign of a breakdown.

To determine the condition of the concrete ballast beneath the ties, the track was recently opened for inspection at several points. Everything was in perfect condition.

On the other hand, a continuation of the same track, laid at the same time on another make of ties and subject to the same traffic, had failed entirely.

The first page of this insert shows pictures of the two stretches of track.

Track maintenance can be utterly wiped out by installation of Dayton Ties.

**The Dayton Mechanical Tie Co.,
Dayton, Ohio.**



Atwater Kent uses Sullivan Compressors

Air power does many jobs for the Atwater Kent Manufacturing Company—and the company's air power plant is a good one. Punchings are removed from power presses, machinery is cleaned, paint is sprayed, and tools are run by air. A large force of workmen is busy with compressed air—and the compressors must stay on the job.

Three Sullivan Angle Compound Compressors supply the air. One is a 480 cubic foot machine, belt driven from a 100 H.P. synchronous motor with direct connected exciter. The other two are 750 cubic foot machines, direct connected to synchronous motors with chain driven exciters.

Remarkable freedom from vibration is one feature which makes the Angle Compound Compressor dependable. A dollar will stand on edge, on Angle Compound, going at full speed.

"Wafer" valves save power. Wide, short, port openings, lightness, low lift, simplicity and long life are "Wafer" valve features.

Multi-step load control gives almost ideal power consumption at any partial load. Three-pass counter-flow copper intercooler aids compression efficiency.

Lubrication is automatic and positive. There's no watching of sight feed cups. Angle Compound Design makes important savings in floor space and foundations.

*Write today for the interesting
Angle Compound Catalog
3283-A*

SULLIVAN
MACHINERY COMPANY
150 So. Michigan Ave., Chicago

HASKELITE *and* PLYMETL

*can readily be repaired—
but they seldom need it*

"WE have proved that it is hardly ever necessary to replace a PLYMETL panel due to the fact that this material will stand so much more abuse than the ordinary light metal covering."

This is from the letter of a large builder of street cars and buses. The same letter describes in detail the repair of a PLYMETL side panel on which the exterior steel sheet had been badly crimped, concluding with this: "They turned out a first class job at a very small cost for material. It is my opinion that if the body had not contained PLYMETL girder sheets, it would have been necessary to replace at least two panels, entailing a very high expense."

HASKELITE roofs resist terrific impacts and when they *are* punctured, it is a simple matter to saw out the damaged section to a rectangular shape, beveled at the edges, fit in a new piece of HASKELITE, glue the edges, and replace the cover.

Yes, HASKELITE and PLYMETL make repair work comparatively easy. But best of all, they make it practically unnecessary.

Haskelite Manufacturing Corp.

133 W. Washington Street
Chicago, Illinois

Canadian Representatives:
Railway & Power Engineering Corp., Ltd.,
Montreal Toronto Winnipeg

Griffin Wheel Company

410 North Michigan Ave.
Chicago, Ill.

Griffin Wheels

with
Chilled Rims
and
Chilled Back of Flanges
For Street and Interurban
Railways

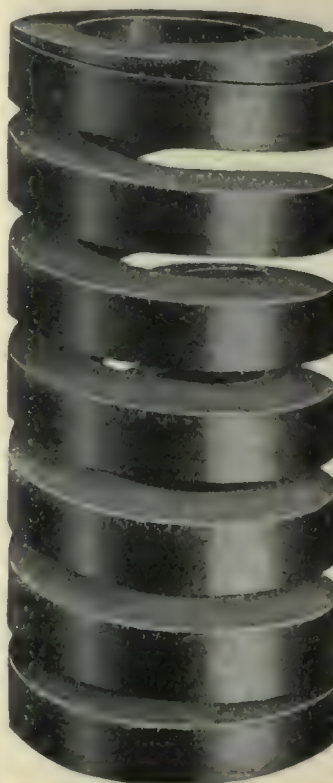
FOUNDRIES:

Chicago
Detroit
Denver

Boston
Kansas City
Council Bluffs
Salt Lake City

St. Paul
Los Angeles
Tacoma

"American"



Light and Heavy SPRINGS

Advantageous location for prompt delivery of raw materials—Ample equipment of modern automatic machinery and appliances — Pyrometer equipped furnaces assuring accurate, uniform heat treatment and over 35 years' spring manufacturing experience constitute a service which means satisfaction

May we estimate on your needs?

AMERICAN SPIRAL
SPRING & MFG. CO.

Established 1887

ARSENAL STATION
PITTSBURGH, PA.,
U. S. A.

McGraw-Hill has your viewpoint

THEREFORE, before sending you a questionnaire to fill out, McGraw-Hill editors and investigators study it carefully to make certain that it conforms to the following requirements:

1. Make the purpose behind the McGraw-Hill questionnaire perfectly clear to the person from whom we solicit information.
2. Restrict our questions to vital matters and express them in simple terms.
3. Recognize all answers as strictly confidential when requested.
4. Make the completed compilations available to all ramifications of industry and trade which can put them to profitable use.

THE PUBLISHERS



"For Outstanding Improvements in Operation!"

1924 Northern Texas Traction
1925 Pittsburgh Railways
1926 Pennsylvania-Ohio Electric Co.

The last three winners of the Coffin Award for outstanding improvements in railway operation have been equipped with

Nachod Block Signals

In addition to convincing the Coffin award judges that they were assuring the absolute safety of their passengers, these three railways also proved their ability to get the most out of their single track lines and to speed up the service, thus increasing their earning capacity.

Nachod or U.S. Signals will do the same for your lines. Write today for catalog.

NACHOD & UNITED STATES SIGNAL CO., Inc.
LOUISVILLE, KY.

ELECTRICAL INSULATION

MICANITE and EMPIRE

Micanite and Super-Micanite
Sheets, Commutator Segments,
and Commutator Rings

Micanite Tubes and Washers

Linotape, Seamless or Sewn Bias
(Yellow or Black Varnished Tapes)

Empire Oiled Cloths and Papers
(Yellow or Black)

Compounds, Varnishes, Etc.

Send for catalog and helpful booklet on Commutator
Insulation and Assembly

MICA INSULATOR COMPANY

Largest manufacturers in the world of mica insulation.

Established 1893

New York: 68 Church St. Chicago: 542 So. Dearborn St

Cleveland
San Francisco

Pittsburgh
Los Angeles

Cincinnati
Seattle

Works: Schenectady, New York; Victoria, Canada; London, England



Cold Dinners

for your passengers?

Not if you use

AJAX

BABBITT for ARMATURES

keeps the rolling stock rolling



The Ajax Metal Company

Established 1880

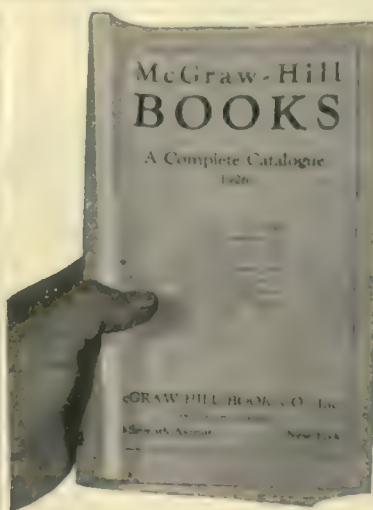
PHILADELPHIA

NEW YORK

CHICAGO

BOSTON

CLEVELAND



How to keep up with your field

How do you keep in touch with developments in your field? Where do you turn for reference, study or research? Where can you turn? What's available? A good part of the written record — the "canned experience" of your field is to be had in McGraw-Hill Books. You have the key to this experience in

New 1926 Catalogue of McGraw-Hill Books

The catalogue lists and describes all McGraw-Hill Books in dozens of different branches of dozens of different fields.

Handy Plan for Your Book Buying

The catalogue describes a plan whereby you can put your book-buying on a convenient budget basis—get the books that you want as you need them—pay for them by the month as you use them.

It gives you the key to the existing literature on many different scientific engineering and business subjects.

It is a valuable catalogue to have handy and a copy is waiting for you if you want one. Just send us your name and address.

Send for a copy—it's free

McGraw-Hill Book Co., Inc.
370 Seventh Avenue, N. Y.

Send me the NEW 1926 McGraw-Hill CATALOGUE to the address given below. The catalogue is free I understand.

Name

Address

City and State

Mail just this coupon

E. 12 18 26

PANTASOTE

Trade Mark

Seat and Curtain Materials
There is no substitute for Pantasote

AGASOTE

Trade Mark

Roofing—Headlining—Wainscoting
The only homogeneous panel board

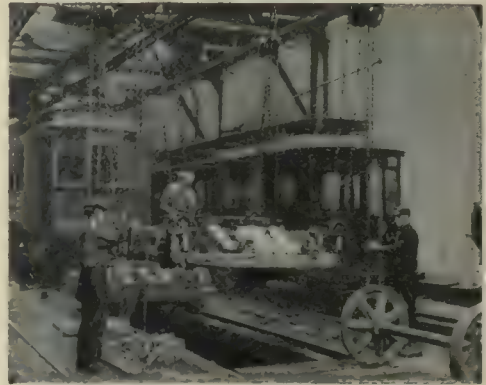
*standard
for electric railway cars
and motor buses*

The PANTASOTE COMPANY Inc.

At 46th, 250 Park Avenue, 4 Street
NEW YORK



TRIBLOC CHAIN HOISTS



*Raise fare values
by lowering shop costs*

Because lower costs invariably increase the relative value of passenger fares, it naturally follows that equipment which helps lower shop costs has potential capacity to increase net profits.

Tribloc Chain Hoist Equipment is qualified by years of consistent results to do this very thing. Sturdy, safe and smooth operating, it aids your men in the quick and satisfactory performance of their work. It is made in types to meet every requirement of the car shop and bus garage. Send for Catalog 7-B.

FORD CHAIN BLOCK COMPANY
2nd and Diamond Sts., Philadelphia, Penna.

We also manufacture "THE MOTORBLOC"
an electrically driven chain hoist.

Change a wheel? Change a harp?
Change a pole?

Simple!



*Easy as putting a brush
in its holder*

All Bayonet Trolley Specialties are made to save time. —mechanic's time, "shopping" time, time off the road. With the Bayonet Harp wheels can be changed in 10 seconds. With the Bayonet Pole Clamp, poles can be changed in 30 seconds. No tools required. Nothing complicated. The only devices of their kind, thoroughly tested and fully approved.

Also Bayonet Special Trolley Wheels and Sleet Cutters.

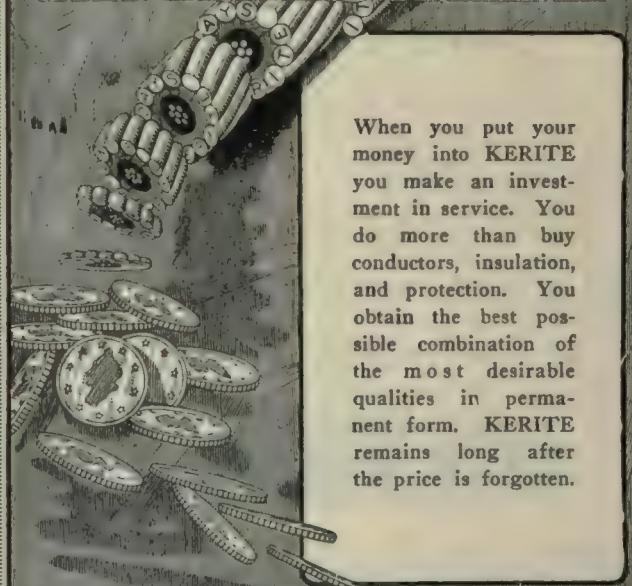
Write us.

**Bayonet Detachable
Trolley Equipment**

BAYONET TROLLEY HARP CO.
SPRINGFIELD, OHIO

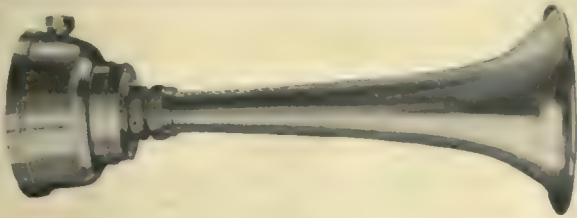
KERITE

AN INVESTMENT



When you put your money into KERITE you make an investment in service. You do more than buy conductors, insulation, and protection. You obtain the best possible combination of the most desirable qualities in permanent form. KERITE remains long after the price is forgotten.

KERITE INSULATED WIRE & CABLE COMPANY
NEW YORK CHICAGO



Strombos Signals for Railway Service

A pleasing sound of tremendous volume is emitted from the powerful Strombos Signal which is admirably suited for railway service. Day in, day out, it broadcasts a warning of approaching danger and promotes safe and efficient railway operation.

The Strombos Signal operates on an air pressure of 10 lbs. and over and is controlled by a lever valve and cord. It uses only 1/10 the volume of air required by a whistle. It has no moving parts which might fail in the emergency.

Write us for more complete data.

AMERICAN STROMBOS CO.
INCORPORATED
18th & Market Sts., Philadelphia, Pa.



Clark-Williams Tubular Iron Pole Reinforcing and Extension Clamps

Years can be added to the life of any iron pole which has become corroded at the ground level with our REINFORCING CLAMPS, or added height may be obtained by using the EXTENSION CLAMPS.
ALSO MOUNTS FOR WOOD POLES.

Ask for quotations on your requirements.

The Clark-Williams Engr. Co.
886 Main St., Bridgeport, Conn.

Represented in Canada by the Canadian Line Materials, Ltd. Toronto, Ont.



Drip Points for Added Efficiency

They prevent creeping moisture and quickly drain the petticoat in wet weather, keeping the inner area dry.

The Above Insulator—No. 72—Voltages—Test—Dry 64,000
Wet 31,400, Line 10,000.

Our engineers are always ready to help you on your glass insulator problem. Write for catalog.

Hemingray Glass Company
Muncie, Ind.

Est. 1848—Inc. 1870

Greater Service Per Dollar Invested



"Tiger" Bronze Axle and Armature Bearings

More-Jones "Tiger" Bronze castings for axle and armature-bearing service was one of our early achievements. This is probably the most widely known bronze on the market. It has stood the test of time. There is nothing better for long, efficient and most economical results. Let us quote you.

More-Jones Brass & Metal Co.
St. Louis, Mo.

MORE-JONES
QUALITY PRODUCTS

B. A. HEGEMAN, Jr., President H. A. HEGEMAN, First Vice-Pres. and Treas.
F. T. SARGENT, Secretary W. C. PETERS, Vice-Pres. Sales and Engineering

National Railway Appliance Co.

Grand Central Terminal, 452 Lexington Ave., Cor. 45th St., New York

BRANCH OFFICES

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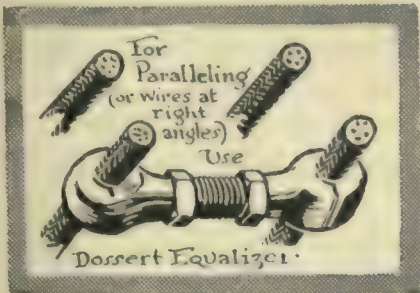
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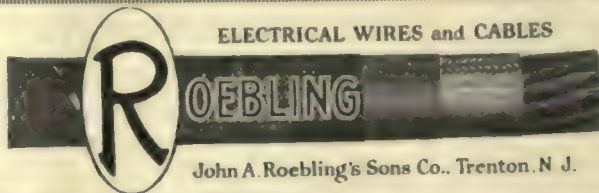
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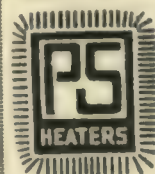
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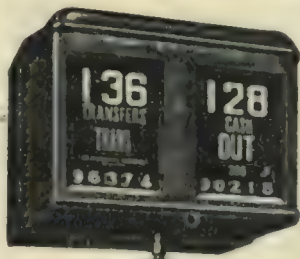
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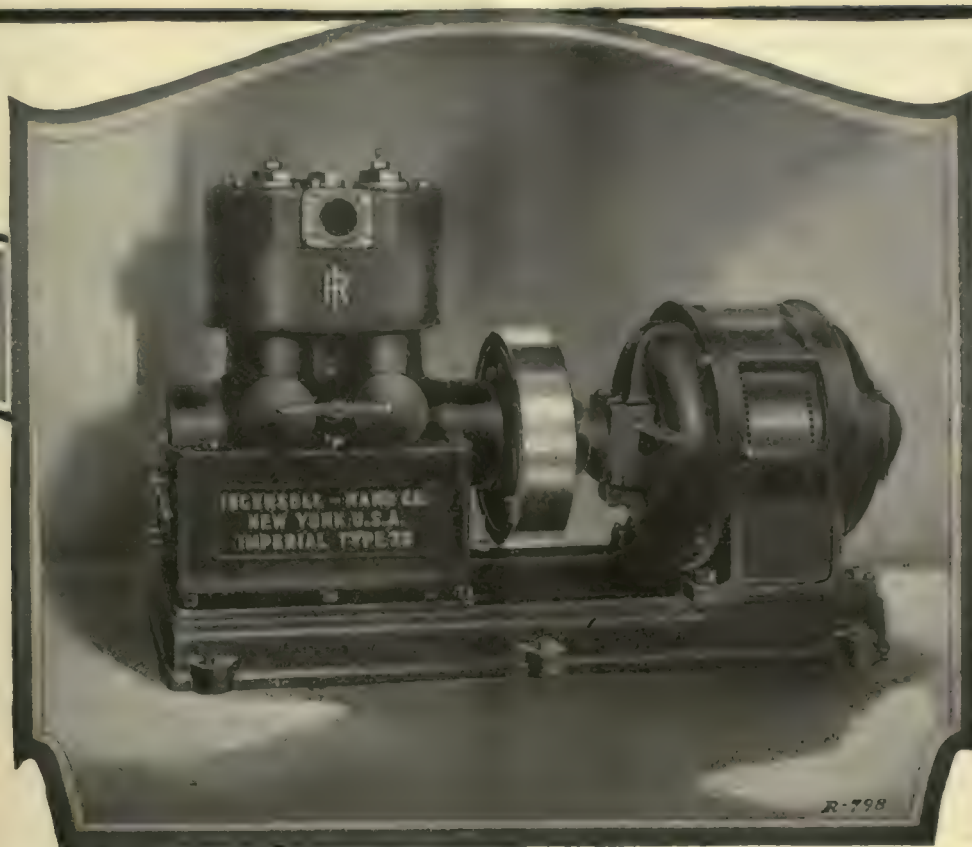
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(Continued on page 78)



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- (Continued on page 80)

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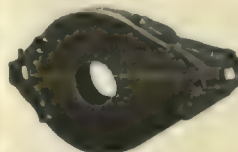


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478E

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ALPHABETICAL INDEX TO ADVERTISEMENTS

	Page		Page		Page		Page
Ahlberg Bearing Co.....	Insert 14	Consolidated Car Heating Co.....	79	International Oxygen Co.....	73	Ramapo-Ajax Corp.....	79
Ajax Metal Co., The.....	67	Cummings Car & Coach Co.....	35	International Register Co.....	74	Richey, Albert S.....	72
American Brass Co., The.....	74	Day & Zimmermann, Inc.....	72	International Steel Tie Co.....	7	Roebling's Sons Co., John A.....	73
American Brown Boveri Electric Corp.....	20-21	Dayton Mech. Tie Co., Insert 63,	64	Irving Iron Works Co.....	59	Rome Wire Co.....	Insert 27-28
American Car Co.....	81	Differential Steel Car Co., The.....	79	Irrington Varnish & Insulator Co.....	70	Russell, Burdall & Ward Bolt & Nut Co.....	49
American Car & Foundry Motors Co.....	Insert 37, 38, 39, 40, 41, 42, 43, 44	Dossert & Co.....	71	Jackson, Walter.....	72	St. Louis Car Co.....	47
American Electrical Works.....	74	Drum & Co., A. L.....	73	Jeandron, W. J.....	71	Safety Car Devices Co.....	8
American Insulating Mach. Co.....	74	Earl, C. I.....	71	Keiker, DeLeuw & Co.....	72	Samson Cordage Works.....	74
American Spiral Spring.....	66	Electric Equipment Co.....	75	Kelly Cooke & Co.....	72	Sanderson & Porter.....	72
American Steel Foundries.....	66	Electric Railway Equipment Co.....	79	Kerite Ins. Wire & Cable Co.....	68	Sandlight Section.....	75
American Steel & Wire Co.....	70	Electric Railway Improvement Co.....	73	Kuhlman Car Co.....	81	Shuler Axle Co.....	61
American Strombos Co.....	69	Electric Service Supplies Co.....	9	Lang Body Co., The.....	Insert 53, 54	Silver Lake Co.....	74
Anasconda Copper Mining Co.....	74	Fageol Motor Co., Insert 37, 38, 39, 40, 41, 42, 43, 44	44	Le Carbone Co.....	71	Smith Heater Co., Peter.....	73
Archbold-Brady Co.....	73	Fisk Tire Co., The.....	32	Leece Neville Co.....	30	Standard Oil Co.....	50
Babcock & Wilcox Co.....	73	Ford Chain Block Co.....	68	Lorain Steel Co., The.....	70	Standard Steel Works Co.....	46
Baker-Raulang Co., The.....	33	Ford, Bacon & Davis, Inc.....	72	McCardell Co., J. R.....	71	Star Brass Works.....	79
Bayonet Trolley Harp Co.....	68	"For Sale" Ads.....	75	McClellan & Junkersfeld.....	72	Stevens & Wood, Inc.....	72
Beeler Organization, The.....	72	General Electric Co., 22, Back Cover		McGraw-Hill Book Co., Inc.....	67	Stone & Webster, Inc.....	72
Bell Lumber Co.....	72	General Tire & Rubber Co., The.....	24	McGraw-Hill Book Co., Inc.....	67	Suckel Co., A.....	73
Bemis Car Truck Co.....	70	Globe Ticket Co.....	62	Mica Insulator Co.....	67	Studebaker Corp., Insert 12, 13	
Bethlehem Steel Co.....	79	Gold Car Heating & Ltg. Co.....	79	More-Jones Brass & Metal Co.....	69	Sullivan Machinery Co.....	65
Bibbins, J. Rowland.....	72	Graham Bros.....	25	Nachod and United States Signal Co., Inc.....	67	Texas Co., The.....	48
Brennan, F. J.....	73	Griffin Wheel Co., The.....	66	National Brake Co., Inc.....	23	Thornton Trolley Wheel Co.....	74
Bridgeport Brass Co.....	18	Hale-Kilburn Co.....	45	National Pneumatic Co.....	15	Tool Steel Gear & Pinion Co., The	36
Brill Co., The J. G.....	81	Haskelite Mfg. Corp.....	65	National Railway Appliance Co.....	70	Una Welding & Bonding Co.....	73
Buchanan & Layng Corporation.....	72	"Help Wanted" Ads.....	75	Naugle Pole & Tie Co.....	74	United States Graphite Co., The	61
Buda Co., The.....	60	Hemingray Glass Co.....	69	Ohio Brass Co.....	5	Universal Lubricating Co.....	79
Budd Wheel Co.....	26	Hemphill & Wells.....	72	Okonite-Callender Cable Co., Inc., The.....	74	Van Loan Corp., Irving S.....	75
		Heywood-Wakefield Co.....	29	Okonite Co., The.....	74	"Want" Ads.....	7
		Holst, Englehardt W.....	72	Pantasote Co., Inc., The.....	68	Wason Mfg. Co.....	81
		Hubbard & Co.....	70	Perey Mfg. Co., Inc.....	79	Waukesha Motor Co.....	Insert 11
		Hyatt Roller Bearing Co.....	34	Phoenix Ice Machine Co., The.....	60	Westinghouse Electric & Mfg. Co.....	2
		Ingersoll-Rand Co.....	77	Positions Wanted and Vacant.....	75	Westinghouse Traction Brake Co.....	10
		International Creosoting & Constr. Co.....	51	Railway Trackwork Co.....	4	Wharton, Jr. & Co., Wm.....	70
		International Harvester Co. of America.....	31	Railway Utility Co.....	80	"What and Where to Buy".....	76, 78
						White Engineering Corp., J. G.....	72
						Wish Service, The P. Edw.....	73
						Wood Co., Chas. N.....	79

WHAT AND WHERE TO BUY—Continued from page 78

Testing Instruments (See Instruments, Electrical Measuring, Testing, etc.)	Track, Special Work	Trolley Wheels (See Wheels, Trolley)	Ventilators, Car	Roebling's Sons Co., J. A.
Thermistats	Bethlehem Steel Co.	Trolley Wheels and Harps	Brill Co., The J. G.	Welding Wire and Rods
Consolidated Car Heating Co.	Ramapo Ajax Corp.	Electric Service Supplies Co.	Cincinnati Car Co.	Railway Trackwork Co.
Gold Car Heating & Lighting Co.	Wm. Wharton, Jr. & Co., Inc.	More-Jones Brass & Metal Co.	Consolidated Car Heating Co.	Wheel Guards (See Fenders and Wheel Guards)
Railway Utility Co.		Star Brass Works	Natl Ry. Appliance Co.	Wheel Presses (See Machine Tools)
Smith Heater Co., Peter	Trackless Trolley Cars	Thornton Trolley Wheel Co.	Railway Utility Co.	Wheels, Car, Cast-Iron
Ticket Choppers & Destroyers	Brill Co., The J. G.	Trolley Wire	St. Louis Car Co.	Griffin Wheel Co.
Electric Service Sup. Co.	St. Louis Car Co.	American Brass Co.	Vestibule Linings	Wheels, Car Steel & Steel Tire
Tickets and Transfers	Tractors, Industrial, Electric	Amer. Electrical Works	Haskelite Mfg. Corp.	American Steel Foundries
Globe Ticket Co.	Baker-Raulang Co.	American Steel Foundries	Electric Railway Improvement Co.	Bemis Car Truck Co.
Ties, Mechanical	Transfers (See Tickets)	Amer. Steel & Wire Co.	Lorain Steel Co., The	Carnegie Steel Co.
Dayton Mechanical Tie Co.	Transformers	Anasconda Copper Min. Co.	Metal & Thermit Corp.	Standard Steel Works
Ties and Tie Rods, Steel	American Brown Boveri Corp.	Bridgeport Brass Co.	Ohio Brass Co.	Wheels, Steel Disc
Carnegie Steel Co.	General Electric Co.	Roebling's Sons Co., J. A.	Railway Trackwork Co.	Budd Wheel Co.
International Steel Tie Co.	Westinghouse E. & M. Co.	Rome Wire Co.	Una Welding & Bonding Co.	Wheels, Trolley
Ties, Wood Cross (See Poles, Ties, Posts, etc.)	Treads, Safety, Stair, Car Step		Welders, Portable Electric	Bayonet Trolley Harp Co.
Tires	Irving Iron Works Co.	Trolleys and Trolley Systems	Electric Railway Improvement Co.	Electric Railway Equipment Co.
Fisk Tire Co.	Tree, Wire	Ford Chain Block & M. Co.	Metal & Thermit Corp.	Electric Service Supplies Co.
Tires, Rubber	Okonite Co.	Trucks, Car	Ohio Brass Co.	General Electric Co.
General Tire & Rubber Co.	Okonite-Callender Cable Co.	Bemis Car Truck Co.	Railway Trackwork Co.	More-Jones Brass & Metal Co.
Tongue Switches	Trolley Buses	Brill Co., The J. G.	Una Welding & Bonding Co.	Co.
Wm. Wharton, Jr. & Co., Inc.	General Electric Co.	Cincinnati Car Co.	Westinghouse E. & M. Co.	Star Brass Works
	National Railway Appliance Co.	Cummings Car & Coach Co.		Wheels, Wrought Steel
Tool Steel	Ohio Brass Co.	St. Louis Car Co.	Welders, Rail Joint	Carnegie Steel Co.
Bethlehem Steel Co.	Trolley Buses, Retrieving		Ohio Brass Co.	Whistles, Air
Carnegie Steel Co.	General Electric Co.	Trucks, Motor	Railway Trackwork Co.	General Electric Co.
Tools, Track & Miscellaneous	More-Jones Brass & Metal Co.	International Harvester Co.	Una Welding & Bonding Co.	Ohio Brass Co.
Amer. Steel & Wire Co.	Co.	Truss Planks	Westinghouse E. & M. Co.	Westinghouse E. & M. Co.
Electric Service Sup. Co.	National Railway Appliance Co.	Haskelite Mfg. Corp.	Welding Processes and Apparatus	Westinghouse Traction Brake Co.
Hubbard & Co.	Ohio Brass Co.	Tubing, Yellow and Black.	Electric Railway Improvement Co.	Wire Rope
Railway Trackwork Co.	Trolley Buses	Flexible Varnish	General Electric Co.	Amer. Steel & Wire Co.
Torches, Acetylene (See Cutting Apparatus)	Brill Co., The J. G.	Irvington Varnish & Ins. Co.	Metal & Thermit Corp.	Roebling's Sons Co., J. A.
Tower Wagons & Auto Trucks	General Electric Co.	Turbines, Steam	National Railway Appliance Co.	Wires and Cables
J. J. McCardell & Co.	Westinghouse E. & M. Co.	American Brown Boveri Corp.	Ohio Brass Co.	American Brass Co.
Towers and Transmission Structures	Trolley Material (Overhead)	General Electric Co.	Railway Trackwork Co.	Amer. Steel & Wire Co.
Archbold-Brady Co.	Electric Service Sup. Co.	General Electric Co.	Una Welding & Bonding Co.	Anasconda Copper Min. Co.
Westinghouse E. & M. Co.	More-Jones Brass & Metal Co.	Electric Service Sup. Co.	Westinghouse E. & M. Co.	Bridgeport Brass Co.
Track Expansion Joints	Co.	Perey Mfg. Co., Inc.	Welding Steel	General Electric Co.
Wm. Wharton, Jr. & Co., Inc.	Ohio Brass Co.	Turntables	Electric Railway Improvement Co.	Kerite Insulated Wire & Cable Co.
Track Grinders	Westinghouse E. & M. Co.	Electric Service Supplies Co.	Railway Trackwork Co.	Okonite Co.
Metal & Thermit Corp.	Trolley Shoe	Valves	Una Welding & Bonding Co.	Inc.
Railway Trackwork Co.	Miller Trolley Shoe Co.	Westinghouse Tr. Br. Co.	Welding Wire	Okonite-Callender Cable Co.
Ramapo Ajax Corp.	Trolley Wheel Bushings	Varnished Papers and Silks	American Steel & Wire Co.	Roebling's Sons Co., J. A.
Una Welding & Bonding Co.	Co.	Irrington Varnish & Ins. Co.	General Electric Co.	Rome Wire Co.
	Star Brass Works		Railway Trackwork Co.	Westinghouse E. & M. Co.

Eliminate rail joints
by
THERMIT-WELDING
METAL & THERMIT CORPORATION
120 Broadway, New York City, N.Y.

RAILWAY UTILITY COMPANY
CAR COMFORT WITH HEATERS
UTILITY REGULATORS
VENTILATORS
141-151 West 22d St. Chicago, Ill. Write for Catalogue
1328 Broadway New York, N.Y.

Superior Service at Considerably Lower Cost



Light-weight Interurban type car built by Kuhlman.

Warren & Jamestown Street Railway introduces modern cars to advantage

Many electric railways recognize the fact that the best way to build financial stability is to introduce—

New **BRILL** Modern Cars

A saving of over 18 cents per car mile was made on the Warren & Jamestown Street Railway with new light-weight cars, as shown by the following comparative figures.

	Actual Operating Costs Per Car Mile	
	Old Cars	New Cars
Way and Structures.....	11.87	2.85
Maintenance of Equipment.....	4.35	1.55
Power	10.25	7.75
Conducting Transportation.....	11.18	9.18
Traffic		
General and Misc.	6.54	4.67
Total	44.19	26.00

But this alone does not represent all the advantages of modern equipment. The efficient and more attractive service thus made possible also makes the investment worth while.

The J. G. Brill Company	-	-	Philadelphia
American Car Company	-	-	St. Louis
The G. C. Kuhlman Car Co.	-	-	Cleveland
Wason Manufacturing Company	-	-	Springfield, Mass.

CAR MILEAGE RECORD

London & Port Stanley Railway
1916 - 1925

Car No. 2	515,025 mi.
Car No. 4	530,566 mi.
Car No. 6	446,240 mi.
Car No. 8	511,463 mi.
Car No. 10	485,246 mi.
Car No. 12	495,002 mi.
Car No. 14	466,545 mi.

Total Car Miles 3,450,087

And never a whimper from the Gears

These seven interurban cars on the London & Port Stanley have averaged nearly 500,000 miles in the last 10 years and never have their G-E Gears and Pinions given the slightest bit of trouble.

Even now, these gears and pinions, one set of which is shown above, are still good for further use. They were removed not on account of wear, but because new traffic conditions necessitated a change of gear ratio.

Such long-lived, trouble-free service offers convincing proof of the remarkable quality of G-E Gears.



General Electric has carried its research work in metallurgy, its testing and heat-treating processes on gearing, to the point where G-E Gears and Pinions can be installed and then forgotten.



GENERAL ELECTRIC

GENERAL ELECTRIC COMPANY, SCHENECTADY, N. Y., SALES OFFICES IN PRINCIPAL CITIES

ELECTRIC RAILWAY JOURNAL



WEST BRIDGFORD URBAN DISTRICT COUNCIL

Common carriers on streets, highways, and rails, in Europe, as in America, are being Timken-equipped. The special considerations of safety, comfort, economy, endurance and speed are being met by the special features of Timken Bearings and the responsibility of the Timken institution.

THE TIMKEN ROLLER BEARING CO., CANTON, OHIO



The residential limited

Back from the tracks lies virgin territory as far as trolley invasion is concerned—and consciously so. The inhabitants of these semi-rural sections seek not the inconvenience, but the quietude, although inconvenience is theirs. The ordinary public conveyance is, through its disturbing element, most unwelcome.

Many traction companies are today following the modern trend by moving inoffensively into the suburbs, meeting their patrons and selling their service with luxuriously appointed coaches.

These gasoline parlor cars, bulky as they are, equipped with motors capable of developing speed to compete with electric road schedules, are giving traditional electric road safety through the security of Westinghouse Automotive Air Brakes.



The recognized leaders among builders of highway transportation have accepted Westinghouse Air Brakes as the method of retardation in keeping with modern speed, bulk, and perplexing traffic conditions that are detrimental to security and a sane service with physically actuated brakes.

Illustrated above is the new White, a recent 6 cylinder entrant into the field of highway transportation that is meeting favor among operators, and is, like its smaller brother the four cylinder 50-B, factory equipped with Westinghouse Automotive Air Brakes.

WESTINGHOUSE TRACTION BRAKE COMPANY
Automotive Division, Wilmerding, Pa.

6163

WESTINGHOUSE AUTOMOTIVE AIR BRAKES

A Resistance Welder Of New and Better Design

Ample capacity, flexibility of control and a rigid arc-welded steel frame

NOT MERELY in one or two details, but throughout its construction is this new O-B Type LW Resistance Welder better built, for maximum reliability, safety, and continuity of service.

It is built of steel, on a unique sectionalized plan. Each of its 14 interchangeable resistance element units may be lifted out separately for inspection. They are arranged in two separate series-connected element blocks instead of in a single block, thus reducing voltage stress by half.

Insulation has been developed to such a degree that shorts and grounds are virtually impossible. And its special refractory porcelain insulators withstand the rapid changes in temperature without harm. In addition, the welder affords exceptional rapidity of heat dissipation. These properties, together with the strength of a rigidly braced, arc-welded steel frame, give you the maximum in possible service.

Use this portable machine for welding rail bonds, building up cupped joints, and for miscellaneous shop work. See how quickly it pays for itself, not once, but many times.

Write for Folder 50B which gives complete details.

Ohio Brass Company, Mansfield, Ohio
Dominion Insulator & Mfg. Co., Limited
Niagara Falls, Canada

2418

Ohio Brass Co.

PORCELAIN
INSULATORS
LINE MATERIALS
RAIL BONDS
CAR EQUIPMENT
MINING
MATERIALS
VALVES



Pressed steel frames support the insulators.



Interchangeable resistance element units are readily accessible for inspection.

Operates on 400 to 600 volts. Current steps range from 30 to 210 amperes. Has safety control.

Let us recapitulate the findings on

DUPLEX AIR AND MAGNETIC **BRAKES**

One of the features of BALANCED DESIGN

From the brake tests conducted by the Buffalo & Erie on July 17, 1926.

Tests were made on both double and single truck cars, first with normal rail and then with 1,075 ft. of both rails greased. Results for the double truck car weighing 37,500 lb. and with air pressure about 70 lb., showed an advantage for the Duplex Brakes of 192 feet and 714 feet respectively, in stopping from a speed of approximately 45 mph.

From further tests conducted by the Buffalo & Erie on July 20th.

Heads of both rails on a straight section of track coated with heavy car oil for 700 ft. Car speed 45 mph. Car stopped in 470 ft. with application of both air and magnetic brakes. Car went through 700 ft. oiled section and 85 ft. on dry track with air alone.

From results of our own tests—

"60 mph to stop in 800 feet on normal dry track."

BALANCED DESIGN resulted in the first practical application of this most modern braking system. It is typical of a modern car building program in which new speed, new comfort, new operating economy and new safety have been made the basis for car designs that are really NEW.

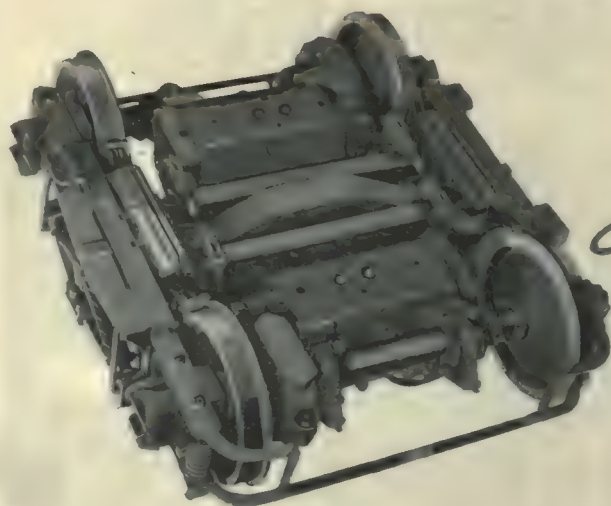
Let us talk it over with you.

THE CINCINNATI CAR COMPANY
CINCINNATI, OHIO

CINCINNATI

New

CARS



*A step ahead
of the modern trend*



“Perishable materials are sometimes utilized in the construction of track, in the effort to secure flexibility, and *the life of the track is shortened to that of the perishable material*”*

THIS simple idea is one of the fundamentals of Twin Tie construction. The combination of steel and concrete provides a uniform structure in which no part limits, by its shorter life, the life of the whole.

When steel, well proportioned, provides large bearing surfaces, tie members, and reinforcement for the concrete foundation of such construction, the life of the rail becomes the limiting factor in the life of your track.

Initial costs of twin tie construction are very low. Detailed figures from many jobs are available for comparison with your estimate and costs.—Write for them today.

*Quotation from a paper, “Modern City Track,” read by Nelson R. Love, Chief Engineer of The Denver Tramway Corporation, at the Mid-West Electric Railway Association Meeting at Denver, July, 1926. We will be pleased to mail a copy of the complete article to those interested.

The International Steel Tie Co.
Cleveland, Ohio

Steel Twin Tie Track

Renewable Track—Permanent Foundation

Gary wheels
are *safe* ~ ~ ~ ~ ~

Gary wheels
are *economical*.

Gary wheels
are *dependable*.

*What more
can be said?*

Illinois Steel Company

General Offices: 208 S. LaSalle St., Chicago, Illinois



ELECTRIC SERVICE SUPPLIES CO.

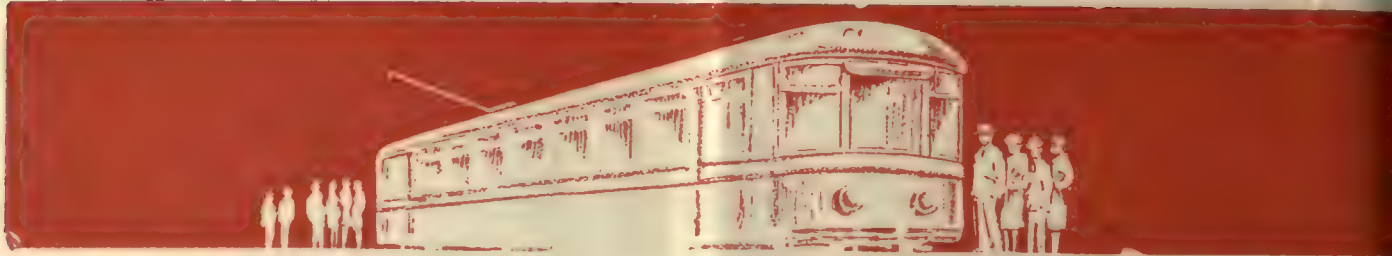
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NEW YORK
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88 Broad St.
LYMAN TUBE & SUPPLY CO., LTD. MONTREAL, TORONTO, VANCOUVER

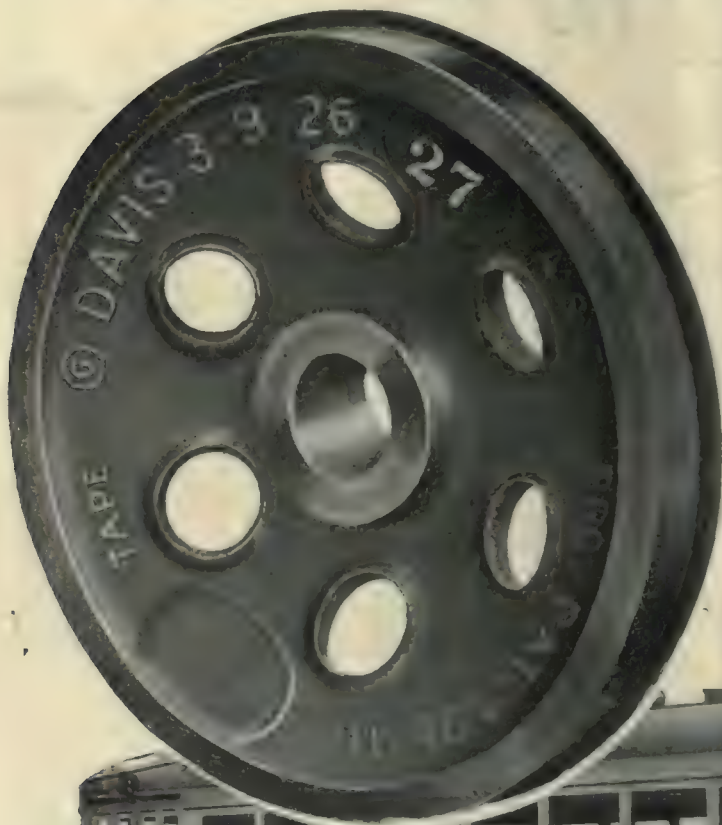
CHICAGO
Illinois Merchants' Bank Bldg.
DETROIT
General Motors Bldg.

SCRANTON
316 N Washington Ave



DAVIS "One-Wear" Steel Wheels

—longer life and greater mileage



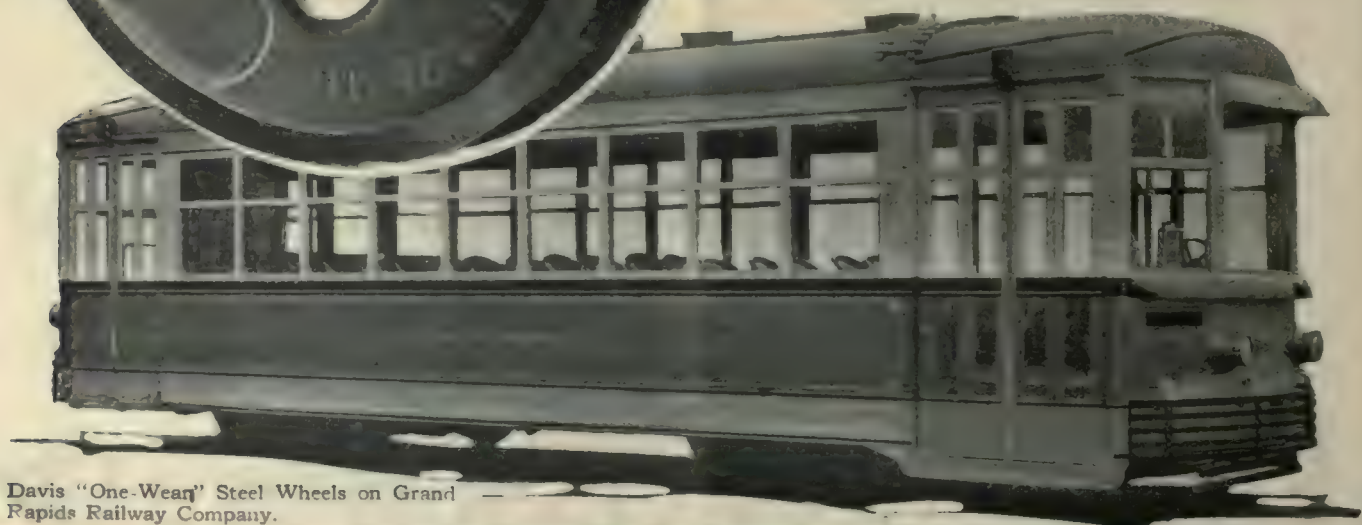
Today, experienced buyers are specifying Davis "One-Wear" Steel Wheels for greater serviceability of equipment. Made from special steel, and heat-treated, the Davis "One-Wear" Steel Wheel is fundamentally strong.

The usual maintenance requirements and expense in keeping wheels in service is avoided. Throughout their longer life, they need no contour reconditioning.

Scientifically made so as to possess greatest strength, they resist the greater stresses of modern operation.

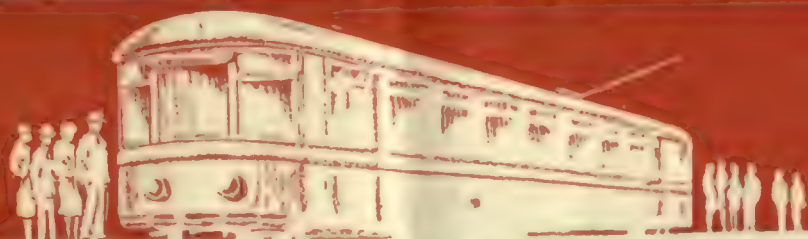
Freedom from flats and shell-outs is worth your investigation.

Why not have this longer life, greater mileage, and real economy.



Davis "One-Wear" Steel Wheels on Grand Rapids Railway Company.

Modern Wheels for Modern Cars



American Multiple Unit Clasp Brake

Speedier Service
Schedules demand
QUICK
RETARDATION!

American Multiple Unit Clasp Brakes on new Electrified Train of Chicago, South Shore and South Bend Railroad.



Time is an important factor in modern suburban and street railway service. Obtaining higher rates of retardation is one way of gaining time and keeping faster schedules. It depends on your brakes.

American Multiple Unit Clasp Brakes

balance the forces in the truck and double the friction area of the Brake Shoes. American Multiple Unit Clasp Brakes are designed and manufactured on a sound engineering basis to produce short, smooth stops that modern service demands.

AMERICAN STEEL FOUNDRIES

NEW YORK

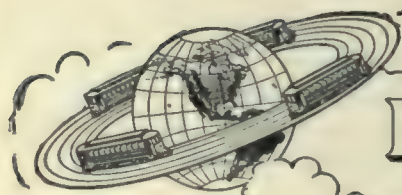
CHICAGO

ST. LOUIS

Modern Brakes for Modern Cars



The creation and maintenance of car advertising space values requires the same degree of highly specialized knowledge as the construction and maintenance of railroads. Such tasks should be delegated only to those of widest experience and longest record of success.



Barron G. Collier

INCORPORATED

CANDLER BLDG. NEW YORK

Merry Christmas



and a HAPPY·NEW·YEAR



NATIONAL PNEUMATIC COMPANY

Of all the phases of modernization, increased schedule speed has the most far-reaching effect on earnings. It boosts your "production" per man-hour, and thereby reduces operating cost per car-mile. Most important of all, it sells more service.



Do modern cars increase schedule speed?

Here are reports from six roads. Each has improved its schedules during recent years. In each case modern cars were necessary. General Electric car equipment is used on every road.

"New equipment was necessary to maintain the increased schedule speeds in most cases."

LEWIS (P. Q.) TRAMWAYS CO.

"New light-weight cars, weight 32,000 pounds using GE-258 Motors, have been purchased and these accelerate much faster than the older, heavy type of car."

MORRIS COUNTY (N. J.) TRACTION CO.

"Schedule speeds increased by a gradual cut in running time; also through new equipment affording better acceleration."

NEW ORLEANS (LA.) PUBLIC SERVICE, INC.

"Schedule speeds slightly increased. By reducing stand time; also by the use of new equipment."

BIRMINGHAM (ALA.) ELECTRIC CO.

"Our schedule speed has been increased. Made possible by better track conditions; improvements in equipment such as light-weight all-steel construction and improvements in the motor design which give the car a faster acceleration and running speed; giving more attention to schedule maintenance and construction; a more thorough study of traffic conditions."

SAN ANTONIO (TEX.) PUBLIC SERVICE COMPANY



The resources and the service of the entire G-E organization are available to consider the problems of modernization and co-ordination—to find the most effective means of transportation and to build appropriate equipment.

"Schedule speed increased from 8 miles to 9.2 miles an hour. This was accomplished by making a survey and finding every possible place where the speed could be increased, and also by using new equipment in the form of safety cars with a quick pick up and by eliminating all unnecessary lagging."

WISCONSIN POWER & LIGHT CO.

GENERAL ELECTRIC

Electric Railway Journal

Consolidation of Street Railway Journal and Electric Railway Review

Published by McGraw-Hill Publishing Company, Inc.

CHARLES GORDON, Editor

Volume 68

New York, Saturday, December 25, 1926

Number 26

Another Shift in the New York Commissions

CHANGES in the public service commission law of New York enacted by the last Legislature will go into effect on Jan. 1. They are part of the so-called reform and economy program of Governor Smith. Among other things a new public service department is created to be headed by the chairman of the present Public Service Commission. This body will take over the Public Service Commission, which has jurisdiction elsewhere than in New York City, and the Transit Commission, which is local to the greater city. That is only part of the story. Under the provisions of the state department law, passed by the 1926 Legislature, the Governor will have control over sixteen out of the eighteen groups of governmental machinery with czar-like power of appointment and removal.

The changes about to be put into effect are just another instance of the tinkering in recent years with the administration of the public service law. For some time after the passage of the original legislation back in 1907, under Governor Hughes, there was no tendency on the part of legislators to toy with the law. Since then, however, there has been hardly a legislative session at which some changes have not been advocated. This is cited as a fact, not as a justification or a condemnation.

The excuse for the present consolidation of activities of the regulatory commissions is that they are both quasi-judicial bodies doing the same kind of work. At the time of the approval of this latest change, considerable doubt was expressed as to the advisability of the move. Next in importance, perhaps, to the consolidation is the restoration to the Governor of the right of removal of commissioners on charges. The original law, enacted under Governor Hughes, provided this feature. Under the administration of Governor Miller, the law was amended so that a member of the commission could be removed only on a two-thirds vote of the Legislature.

During the 1926 session of the New York Legislature nothing more was attempted than to arrange the structural framework necessary to group the activities of the more than 150 departments and bureaus of the state into eighteen departments. Since the adjournment of the Legislature, however, a reorganization commission has been at work preparing amendments to the law to make the transfers of legal authority such as are necessary to insure the functioning of various activities of government. Already Governor Smith is suggesting still further modification of the public service commission law, as referred to elsewhere in this issue. Legislation to this end will undoubtedly be introduced early in the coming session. Still further changes would appear to be necessary to the public service commission law and the state department law defining the

general structure of the new department of public service. As indicated before, the practicability of the present arrangement has been seriously questioned. That is a point which can be settled only by the actual results recorded under the new arrangement.

Retail Merchants Have a Direct Interest in Transportation

THE record of the attitude taken by retail merchants on the transportation question is not a particularly enviable one. It has been narrow rather than broad, nearsighted and expedient rather than constructive. Although transportation is primarily a community problem, the merchants' attitude has consistently worked against sound progress.

Opposition of retail merchants was largely responsible for the abandonment of skip-stop operation in many cities despite the obvious advantages which this plan offered in expediting the movement of people between their homes and central business districts. The merchants were more interested in forcing every car to stop at their particular corner than in expediting the movement of the entire mass of riders.

Much the same attitude has been taken on the parking question. Each merchant in the congested business districts would be perfectly content to advocate parking restrictions, provided that these did not apply in front of his own establishment. When a rerouting plan is proposed to reduce congestion through the elimination of overlapping or interference between various car routes, downtown merchants are usually in favor of the plan provided the routing is laid out so that every car in the city passes their front door. Even the construction of by-pass highways to route through automobile traffic around business district congestion is frequently opposed by downtown merchants on the ground that prospective customers will be deflected from their establishments.

Business growth in the central areas of American cities lags far behind the rapid increase in outlying community centers. This condition is unquestionably attributable to the attitude of central district merchants. Unless they awaken to the situation this trend will ultimately destroy the value of a central location. People will not and should not tolerate existing conditions. The growth of outlying business centers offers a solution—and spells the ruin of downtown merchants and property owners.

The action of Chicago merchants in advocating the development of transit facilities in the central district at their own expense is particularly significant. In most cities opportunities exist for improving surface travel facilities so as to avoid a large part of the heavy cost of rapid transit construction. Establishment of express streets, skip-stops and the elimination of park-

ing would bring immediate improvement at negligible expense.

Merchants who are beginning to understand the relation between their own welfare and that of their community are taking a more constructive view of current local transportation problems.

It is high time that other merchants awakened to the situation. They are definitely faced with the reluctance of shoppers to submit to the inconvenience and danger of the intolerable congestion which exists in most central business districts. The day has passed when downtown merchants can afford to consider only their own business to the exclusion of the community's convenience and welfare.

Foremen's Conferences Help to Improve the Shop Service

AT A MEETING of the New York Railroad Club on Oct. 15, helpful information was given on methods being followed by a number of the steam railroads in and about New York to better the working conditions of shop and other equipment employees. Thus this meeting assists, at least in part, to answer the question raised last week, i.e., how to recruit the right kind of men in the equipment department, how to keep them there in a contented state of mind, and how to train them for more responsible, and consequently more lucrative, positions in the future. All of these answers are based on the establishment of educational courses for both foremen and those in less responsible positions in railway mechanical departments.

Some of the steam roads have developed the apprentice system extensively and these courses appeal with especial force to the average railway apprentice because they mean he will have special instruction fitted to his needs, whether he has had merely a high school education or is a college graduate. The large number of young men annually enrolled in correspondence schools shows the desire that most of them have, especially when their opportunities for school attendance have been limited, to supplement their education, usually along the lines of the industry in which they are engaged at work. Railway educational courses allow them to do this while receiving pay and working in surroundings conducive to study, i.e., in association with other minds keen on acquiring the same knowledge, under personal instruction, and with large "laboratory" facilities.

The foremen's training courses, described in the New York Railroad Club papers, are of a different nature, but their popularity has been such that their number among large railroad and industrial corporations has increased very rapidly during the last few years. The purpose of such conferences is partly to broaden the background of foremen by exchanges of experience among themselves, partly to bring to their attention desirable methods applicable to their work which have been developed elsewhere, perhaps outside of the industry, and partly to allow them to pursue studies along collateral lines, such as legal, financial and accounting matters related particularly to their industry.

Testimony of the popularity of both the apprentice courses and foremen's conferences among the railroads entering New York was given in much detail in the series of papers before the New York Railroad Club,

already mentioned. In this case, age seems to have made no difference. Thus, one group of foremen's conferences was mentioned in which the work scheduled was to have finished in April, but the class was so enthusiastic that the meetings were carried on until the latter part of June, when the summer weather made further continuation impracticable, yet three or four men in the class were upward of 70 years of age, and at least seven were over 60.

Possibilities for Foremen Conferences on Electric Railways

IN PERHAPS no industry are the reasons for both apprentice schools and foremen conferences so outstanding as in the electric railway industry. In manufacturing, mechanical methods necessarily have to be more or less standardized according to the article being produced. But a railway shop is devoted primarily to repairs. In other words it is designed not to turn out one finished article only, but to undertake a thousand pieces of work, each differing from the other in considerable detail, because of the nature of the repair and the type of equipment repaired.

In a sense also an electric railway company is better able to carry on such a series of conferences than a steam railroad because its shops usually are in one city so that all of the foremen can easily be gathered together for conferences and discussions. Nevertheless, as shown by the report of the committee on education at the Cleveland convention, not very much is being done along these lines by electric railway companies. A conspicuous exception is the notable work being done on the Boston Elevated Railway, under the direction of Prof. H. H. Norris, whose illuminating representations of foremen's conferences, given at the Cleveland convention as well as previously at Indianapolis and Boston, have done much to awaken interest in this subject on the part of the industry at large.

Some electric railway companies may be deterred from engaging in foremen's conferences because they consider that they are not large enough, having perhaps only three or four foremen. In this case, the wisest plan is undoubtedly to join with some industry in the town in which they are situated. It will be found that many of the problems of the railway and industrial foremen are alike. This applies very largely, of course, to labor matters and to accounting, and probably to some extent to mechanical processes, such as the use of tools, methods of electric welding, etc.

If the testimony given by other industries as to the benefits derived from courses of this kind is true, and there is no reason to doubt it, a long step forward can be taken in the improvement of equipment methods.

Milwaukee's Open House Week a Remarkable Expression of Public Service

SELDOM has the family spirit of a utility been more strongly developed than in Milwaukee. This spirit permeates beyond the officials of the company, beyond even the employees, and out into the community the company serves. The recent "at home" the company held was equally a success among employees, stockholders and the consuming public. On stockholders' day,

out of 16,000 tickets requested, almost 12,000 were used. These owners of the property were glad of the opportunity to see the different units that earned the dividends on their invested savings. Many of the men and women, old in years, marveled at the wonders they saw. Many expressed themselves as well pleased at the splendid exhibits, and several comments were made, such as "I guess my money is safe here and I have some more next time some stock is offered."

It is difficult to estimate the value of such an affair. Even the company officials hesitated to hazard a guess. It is not measurable on any known basis, but certainly the company that has gained from its customers the kindly feeling of pride exhibited has an asset of great grip, the crisp greenback.

Not alone is this an asset to the company. It is likewise a means of instilling that pride of good service in officers and employees alike that should be an inspiration toward still greater efforts. There should be in every one's life something more than merely making a living—that much is only instinctive. Public service through any of our utilities offers that other element of value to employees of such companies, and the promotion of the service spirit by such public exhibits as Milwaukee's "Open House" week would be of value if it did nothing more than this.

Whose Stocking Is Filled—

The Policeman's or the Conductor's?

A CONDUCTOR is only a conductor, but a policeman swings a big stick. Hence the abrupt and often distinctly rude manner adopted toward railway employees by the general public—hence also the honeyed demeanor and almost sycophantic regard frequently expressed by rich and poor alike for the minions of the law. It is not the car operator whose feet are submerged in piles of big and little gifts at Christmas time. He is fortunate to receive a scant "Merry Christmas" from his impatient passengers. It is the hand that writes the traffic "ticket" which receives the warm caress, the crisp greenback.

Yet the policeman is no whit above the average railway employee in his social stratum. A conductor or a motorman occupies a position of responsibility and trust fully as great as the guardian of the city's peace. It is true that there is nothing about him to inspire fear—which, after all, probably motivates the average man in his attempt to cultivate the members of the "Force"—fear, and a desire to obtain special privilege.

But the platform man has certain perquisites which are denied even to the members of the constabulary. He comes daily into close personal contact with his patrons—he is vouchsafed countless opportunities to render little acts of thoughtfulness to those whom he serves—in short, he may, if he wishes, become even more a living, breathing personality in the eyes of the car riders than the blue-coated man of the street intersection. If he is but a numbered automaton with a gruff attitude and a strident voice, he can blame only himself.

Several companies have adopted the scheme of providing their platform men with name badges. Where this has been done, it is worthy of note that patrons have soon fallen into the habit of addressing the railway representatives by name. From the standpoint of the operators and conductors, it would be well if a similar procedure could be adopted for the patrons.

An individual's personality is practically the only thing which cannot be taken from him—it is his to do with as he will. The policeman has behind him the majesty of the law. The conductor has the greater majesty of his own individuality and, in an ever-increasing number of cases, the knowledge that his company stands ready to reward him with greater responsibility as he distinguishes himself in the outpost line of company representatives.

Modern Industry Recognizes Its Responsibilities

CONVINCING evidence is furnished on all sides of the growing appreciation of its responsibilities by modern industry. It is a theme that is constantly recurring as a topic of discussion where business men assemble. Here and there the scoffer may appear, but he is crushed by the weight of the record of accomplishments. In this work of trying to humanize industry, few companies have done more than has the General Electric Company, and few men who have discussed the matter have reduced the subject as a science to simpler terms than did Gerard Swope, president of the General Electric Company, in an address made recently at the annual dinner of the Associated Business Papers. He said modern business was responsible to society in this order: the public, the employee, the shareholder and the industry itself. His conception of industry was that it is not primarily for profit, but for service.

Mr. Swope was very outspoken. He did not seek to make a virtue out of the work of his own company. He said that we know of no better system today than the capitalistic system for rewarding individual effort or corporate effort. In this he is right. The iniquities of the large corporation are as nothing compared with the iniquities of the small proprietor, where the latter still persists in modern society. If industry wants the workers to give to their work the best that is in them, it should remove fear for the future, as the element that has in the past disturbed the worker most. Mr. Swope's plan of approach to the removal of these fears contemplates full recognition by industry of its responsibility to insure employees, see that they are properly housed, urge the value of thrift upon them and deal more forcefully with the problem of unemployment. This is, of course, merely the outline. It certainly is the duty of industry fully to assume these obligations. Mr. Swope made that plain.

So far as the public utilities are concerned, they have long since been in the vanguard of the movement. Instance upon instance could be cited of companies in which each of these things has been carried to a high state of development and it does not seem unreasonable to say that nearly every company of any size has a program that contemplates one or all of these activities. A recent exhibit of the Employees' Mutual Benefit Association of Milwaukee illustrates the wide range of benefits promoted and made possible through co-operation and recognition of public service duty in this modern business organization. Then there are the many other instances of similar activities in the railway field, notably in Philadelphia, Kansas City, St. Louis and other places. They are cited merely to show that industry is recognizing its obligations and to give an idea of the extent to which the program suggested by Mr. Swope has been anticipated in some instances.

Chicago's Dilemma Illustrates the Evils of the Fixed Term Franchise

In the Year of the Chicago Surface Lines' Highest Revenues and Most Efficient Performance the City Is Far from a Solution of Its Difficulties—One of the Underlying Companies Thrown Into Receivership on Account of the Fictitious Crisis Created by Expiration of Surface Lines' Franchises on Jan. 31, 1927

WITH the approach of Jan. 31, 1927, comes the fateful day which will mark the political crisis that confronts the Chicago Surface Lines and the millions of car riders who daily depend on the service of this largest of street railway systems. Though this group of properties is a financial success, and is providing more service and carrying more passengers than ever before, the Chicago Railways Company, comprising the North and West Side lines, has already been thrown into receivership to protect the interests of the investors. The other underlying companies face a similar fate, or at best some form of day-to-day agreement pending solution of the crisis brought on by dilatory tactics on the part of the city in handling its transportation problem.

While the investors in transportation securities thus face a crisis, the car riders of Chicago are also confronted with a serious situation. Under the unification ordinances of 1914, the present operating arrangement was effected, whereby a passenger may travel to any point in the city for a single fare with unlimited free transfer privileges. This arrangement expires simultaneously with the franchise ordinances, and unless some other arrangement is made in the meantime, there is the possibility that the car riders may lose the important advantages of a completely unified system serving the entire city.

The present crisis is in no way attributable to the operating results on the property. Physically, the property is in fine shape. It gives good service and has a substantial degree of public good-will. Its earnings have shown a steady increase, and the combined system carries annually about 850,000,000 passengers. The increase in passengers carried and in gross revenue is running better than 4 per cent above 1925.

The present dilemma in Chicago is the most remarkable example that the industry has yet seen of the situation resulting from the operation of a permanent investment on a fixed-term franchise. Coincident with the expiration of the twenty-year franchises on Jan. 31 next, some \$146,000,000 of underlying bonds fall due. Banking interests sponsoring these bonds are unanimous in declaring that financing of new issues cannot satisfactorily be made with a twenty-year franchise term, and at the same time provide the new money necessary for improvements. On the other hand, the Illinois state law does not, at present, permit franchise terms of longer duration.

Subways are demanded which, with extensions and new lines, will require many million dollars of new capital. There is practical unanimity of opinion that the

elevated and surface lines systems must be consolidated under one operating company. This alone is a stupendous task.

Two proposed plans of settlement have been submitted to the voters of Chicago and defeated. One attempt to make possible a terminable permit failed in the 1925 Legislature through opposition on the part of the city of Chicago and some down-state interests. The problem thus involves co-ordination of the elevated and surface lines, the state Legislature, the City Council and, above all else, the people of Chicago, in order that the many millions of dollars for extensions and subway development may be obtained.

Regardless of the expiring franchises and underlying mortgages, the Surface Lines group has made steady progress until it is now in its highest state of efficiency. More passengers are carried, more money is earned, more and better service is supplied than ever before. Loop movement has been speeded up by extensive rerouting, eliminating many turns, and the new traffic light installations. One hundred cars have been purchased at a cost of \$1,600,000 during the last twelve months, bringing up the total to 445 new cars in about three years. This has made possible the addition of half a billion seat-miles in the same length of time. Yet Chicago today is unprepared with a solution whereby this greatest of all surface line systems may continue to serve except through protection of the court or by some day-to-day agreement that it may effect with the city and the bondholders.

Besides providing operating expenses the car riders have contributed considerably more than \$100,000,000 in public benefits during the last twenty years. The \$45,000,000 traction fund representing the city share of surplus earned has already been mentioned. In addition street paving has required \$16,000,000, maintenance of paving \$6,000,000, street cleaning \$10,000,000 and general taxes \$30,500,000.

CHICAGO SURFACE LINES AN OPERATING ORGANIZATION

To understand the situation in Chicago it is necessary to visualize the financial and corporate structure. The Chicago Surface Lines is an operating organization formed with the passage of the unification ordinances in 1914. The four companies operated under this plan are the Chicago Railways, constituting 58 per cent of the capital value of the entire group; the Chicago City Railway, 34 per cent; the Calumet & South Chicago Railway, 7 per cent, and the Southern Street Railway, 1 per cent.

At the time of the adoption of the present 20-year

franchise in 1907 the value of these properties was fixed by appraisal, the companies agreeing to a considerable reduction. Provision was made that additions to the properties should be recognized as additions to capital, thus establishing a definite value at any period which must be considered the purchase price should the city decide to take over the lines. This combined value, as of Jan. 31, 1926, is \$163,253,374. It is generally recognized that this is far less than the reproduction value of the properties, which is variously estimated at from \$200,000,000 to \$250,000,000.

The Chicago Surface Lines operates the four roads as one property, residue receipts being distributed to them after the payment of all expenses in accordance with their shares in the total capital.

The total outstanding bonded indebtedness of the properties is \$146,371,275, of which \$103,226,275 has been issued by the Chicago Railways, \$36,747,000 by the Chicago City Railway and \$6,398,000 by the Calumet & South Chicago. All of these bonds mature on Jan. 31, 1927, coincident with the expiration of the franchises. Since the operating agreement establishing the Chicago Surface Lines also expires at that time, steps must be taken not only for the protection of the investment but also for the continuance of unified operation under some new plan or through the extension of the present arrangement.

THE TRACTION SITUATION WAS THOUGHT SETTLED TWENTY YEARS AGO

With the approval of the 1907 ordinances the people of Chicago felt that their transportation troubles were over. The franchises were hopefully called the settlement ordinances. They were evolved after many years of dickering and discouragement. The disorganized street car systems of the south and north and west sides were brought into co-operation and machinery was set up for the rehabilitation and extension of the properties.

When the settlement ordinances were followed seven years later by the so-called unification ordinance, requiring the operation of the four companies as a transportation unit, the one-city-one-fare idea became a reality.

Like most franchises of twenty years ago, the 1907 ordinances fixed the maximum fare at 5 cents. They required the companies to pave, maintain and clean the part of the streets occupied by the tracks. In addition, 55 per cent of the net receipts (after deducting 5 per cent of valuation) must be paid to the city and set aside in the city treasury as a traction fund to be used for the improvement of transportation or in acquiring the properties for the city.

Relief from the restriction to a 5-cent fare was obtained in 1919 when the Illinois Public Utilities Commission determined that operation could not be continued on the basis of this rate after the War Labor Board had practically doubled wages. A 7-cent maximum was granted. There was some fluctuation between 7 cents and 6 cents until on July 1, 1920, an 8-cent fare was established. This was maintained until June 14, 1922, when an effort of the state commission to restore the 5-cent fare resulted in court procedure. A 7-cent fare, three tokens for 20 cents, has been in effect since that time.

One of the features of the 1907 ordinances which has been most beneficial in stabilizing maintenance and investment of new capital is the Board of Supervising

Engineers, a non-political body created by the ordinances for the purpose of administration. The chairman of the board, Col. Bion J. Arnold, was named in the ordinances and the city and companies each selected an engineer to constitute the membership. Colonel Arnold and the engineers who have served with him have been practical men, most helpful in their attitude toward the development of the system.

MANY COMPREHENSIVE PLANS HAVE BEEN MADE

During at least half the life of the present franchise there has been a series of efforts to work out a comprehensive plan which would provide a unification of surface lines with the elevated lines and make possible the construction of subways throughout the congested area of the city.

The first concrete suggestion with this end in view was made in 1916 by the so-called Parsons-Ridgway Commission, composed of William Barclay Parsons, chairman; Bion J. Arnold and Robert Ridgway, commissioners, and Walter L. Fisher, special counsel. The commission was empowered by a resolution adopted by the City Council "to make a study and report on a unified system of surface, elevated and subway lines." Its elaborate report has been the basis of practically every study made since that time and its recommendations for unification, subways and service at cost are still accepted as the best solution of the local transportation problem in Chicago.

In 1918 the City Council passed an ordinance known as the "new traction ordinance" providing for the development of a transportation system based largely upon the Parsons-Ridgway-Arnold recommendations. This ordinance provided for the unification of surface and elevated lines, the development and extension of rapid transit facilities by the expenditure of some \$76,000,000 over a stated period and the extension and improvement of surface line facilities by the expenditure of \$2,500,000 per year. It also provided for the construction of a subway through the congested Loop area to take surface cars off the streets. It was based upon service at cost and provided for continuous development.

The proposed ordinance was indorsed by the Chicago Association of Commerce and practically all civic and commercial organizations in the city. It was approved by the Council over the Mayor's veto, but at the referendum election on Nov. 5, 1918, was defeated by a small majority.

This ended traction discussion for a time, but the evident necessity for some solution soon aroused a new interest and the committee on local transportation of the City Council in 1923 instructed Major R. F. Kelker, Jr., consulting engineer, to make a study of the local transportation situation and report on a physical plan for a unified system. Major Kelker's report gave ample statistics on existing facilities and on present and future needs of the city and recommended the consolidation and co-ordination of all transportation lines so as to permit unified operation, the establishment of a single fare on the unified system within the limits of the city with transfers between rapid transit and surface lines, the construction of subways and the expansion of the existing elevated and surface railways. This development was to extend over two periods of construction based upon the relative necessity of the projects.

A new ordinance was framed embodying the prin-

ciples of these recommendations. It provided, as did the 1918 ordinance, that control should be vested in a municipal railway board. Municipal notes of indebtedness were to be issued by the city in payment for the properties and for extensions and improvements. These certificates of indebtedness, to be redeemed out of earnings, were to be secured only by the property and were not to be a general obligation on the part of the municipality. Service at cost and an indeterminate permit to operate were features of this ordinance. It was submitted to a vote of the people on April 7, 1925, but, like the 1918 ordinance, was defeated.

Following the defeat of the 1925 proposal the committee on local transportation of the City Council has made considerable effort to develop a new plan. An ordinance was drafted by Francis X. Busch, corporation counsel, at the request of the local transportation committee to serve as a basis for discussion. This draft provides for unification of the properties, for the construction of subways to be paid for in part by special assessment upon adjacent real estate, for an indeterminate permit to be issued by the city, for a city board to take over the duties now exercised by the State Commerce Commission and the operation of the properties on a service-at-cost basis.

Hearings on this proposed ordinance soon developed the fact that it would not only require legislation which must be approved in its entirety by the Illinois General Assembly before the ordinance could become effective but that it contained many features which were objectionable to practical transportation engineers.

Representatives of the transportation companies who had attended hearings on this ordinance were requested to suggest a plan of their own. But it was objected on the part of Henry A. Blair, president of the Chicago Surface Lines, and some others, that until legislation could be secured removing the statutory twenty-year limitation on franchises and permitting unification of elevated and surface line companies it was useless to attempt any adequate solution. Studies are being made, however, with a view to determining exactly what should be asked in the form of legislation.

STATE LEGISLATION NEEDED TO EFFECT SOLUTION

Mr. Blair, as early as October, 1924, informed the City Council that it would be impossible to refinance the properties, secure unification and subways and provide the necessary additional capital for extensions and improvements, the latter estimated at about \$250,000,000, on the basis of twenty-year franchises. A bill establishing the terminable permit for all utilities in Illinois in lieu of definite term franchises was introduced in the General Assembly in 1925, but largely because of opposition on the part of the city of Chicago and some down-state interests no effort was made to pass it. A legislative commission was created, however, to investigate the operation of the terminable permit in other states and its feasibility in Illinois, and to report to the next General Assembly. This commission has now practically completed its investigation and its report will be made, in all probability, some time in January. It is hoped that the report will embody the draft of a bill providing for some form of terminable permit. It is highly improbable, however, that the necessary legislation will be passed before the expiration of the franchise.

Apparently there is no objection to the substitution of terminable permits for the definite term franchise law, but there is considerable difference of opinion as to whether the permits should be issued by the Illinois Commerce Commission or by the City Council. The Chicago city administration, although agreeing to terminable permits in principle, is on record against any legislation which does not invest the city with the right to issue the permits and to exercise all of the regulatory powers over local utilities now vested in the State Commerce Commission.

RECENT PROPOSALS A FURTHER COMPLICATION

In the meantime the situation has been complicated by the submission of a proposal by F. J. Lisman & Company to form a company and take over the properties operated by the Chicago Surface Lines without waiting for legislation. Fifty million dollars in new capital would be provided under this plan for extensions and improvements of the Surface Lines. Junior securities would be issued for the outstanding bonded indebtedness on the properties. It is proposed to provide on a service-at-cost basis for the retirement of the \$50,000,000 of new capital in the twenty years of the ordinance period, but unless the ordinance period could be extended, no additional capital could be put into the properties and no provision could be made for the retirement of the other securities. Worst of all, from the public policy standpoint, however, the elaborate scheme of unification and subway construction so incessantly demanded throughout the years as the only feasible solution of the problem could not be realized.

The latest development is the proposal of the Chicago Motor Coach Company to substitute buses for street cars upon the expiration of the franchises. Since it contemplates the destruction of these great properties and a wiping out of the entire capital investment it hardly seems possible that the proposal will receive serious consideration. The manifest impossibility of meeting the enormous transportation needs of the city with motor buses alone must be apparent, even to those who would have no compunction in destroying property and shaking the faith of capital in utility investments.

Busy Year for Indiana Public Service Commission

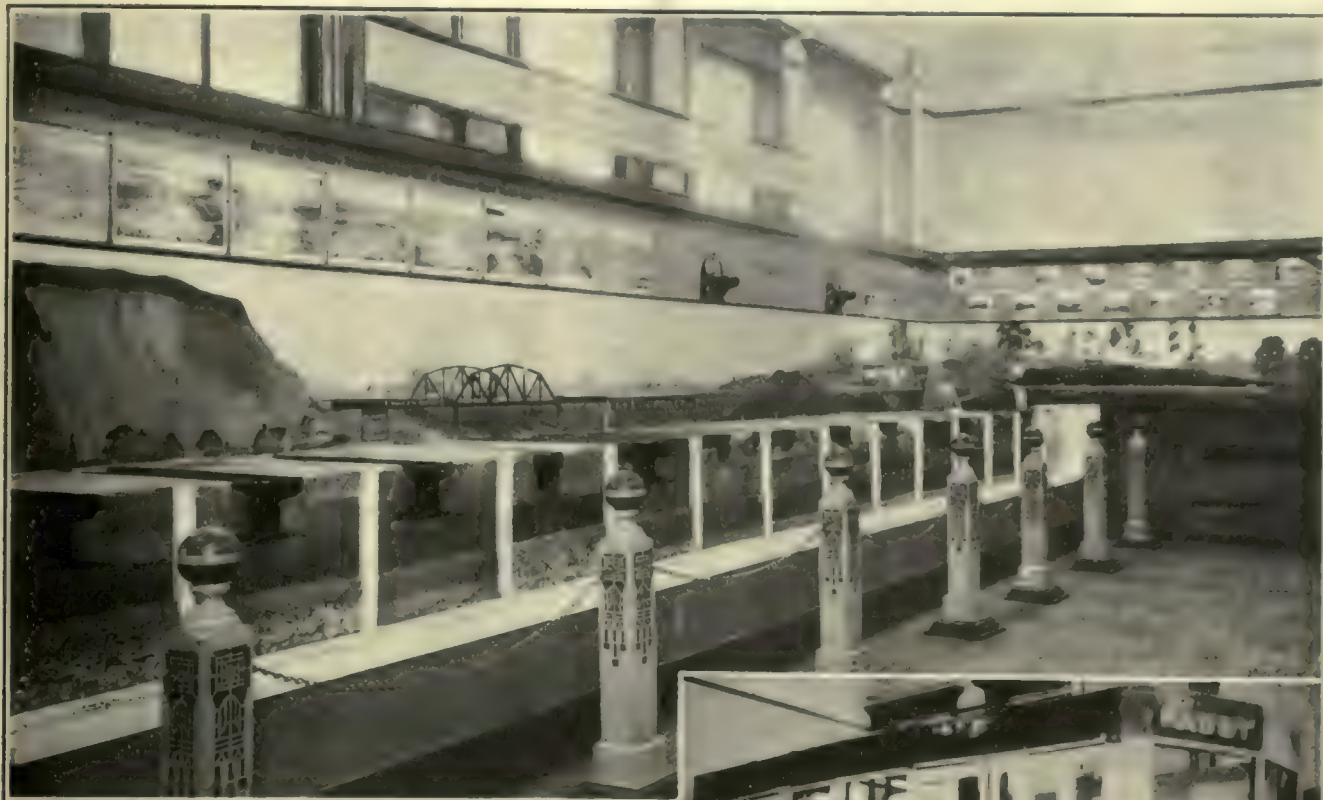
IN THE fiscal year which ended Sept. 30 the Indiana Public Service Commission authorized the issuance of \$467,130 of bonds by municipally owned utilities, \$45,761,805 of securities for private utilities and \$255,628 for other purposes, making a total of \$48,484,564. These figures are contained in the annual report of Howell Ellis, secretary of the commission. This total was \$24,948,880 less than the total for the previous year. The sale of 197,025 shares of common stock of no par value also was authorized. Total fees collected by the commission in the year amounted to \$295,962.

The service department of the commission disposed of 342 adjustment cases. The engineering department in the year made appraisals of utility property totaling \$27,929,824, in addition to the appraisals for current securities for sales purposes.

The total expenditures of the commission for the year were \$144,355. The appropriation for the commission was \$170,000.

Milwaukee Holds Open House

More than 69,000 People Visited Exhibits of the Milwaukee Electric Railway & Light Company During Open House Week—Among This Number 9,479 of the Company's Stockholders Attended on a Day Set Aside for Them



OPEN HOUSE WEEK at Milwaukee proved to be one of the most extensive affairs of this kind on record. The week from Monday, Nov. 8, to Saturday, Nov. 13, was set aside for the users of public service in the city and territory served by the Milwaukee Electric Railway & Light Company. The "at home" really started on the Thursday night previous, when company officials entertained some 250 of Milwaukee's leading citizens, city officials and prominent educators at a banquet served in the auditorium of the public service building. The following day, Friday, was set aside as employees' day. Employees, their friends and families streamed through the company office and points of interest. On Saturday, by special invitation, 9,479 stockholders of the company came in actual contact with the facilities in which their money was invested and the personnel in charge of operations.

The exhibits were set up in seven different groups, as follows: Public service building, Lake power plant, Cold Springs shops, Oneida steam heating station, substations at eight different locations in the city and suburbs, street car stations at West Allis, Oakland Avenue and Fond du Lac Avenue and the Kinnickinnic bus garage. Features of outstanding importance were the opening of the electrical store and the prepared exhibits at the public service building and the starting on Nov. 6 of the new 1,200-lb. pressure steam boiler and turbine unit at Lakeside station. This turbine delivers 7,000 kw.



Some Convincing Demonstrations of Equipment Given to Guests of the Milwaukee Electric Railway & Light Company

In the background of the transportation exhibit (upper view) was a miniature railway train that set in motion signals of various types. In the foreground were sample rail and paving sections showing the heavier construction required for modern day traffic.

One-man operating features (lower view) were explained to the visitors during Milwaukee Open House by means of this life-sized model.

and exhausts steam at 300 lb. pressure for operating the older steam turbine units. Powdered coal is used to fire this new boiler and the older units as well.

One of the rooms at the public service building was devoted to railway exhibits. A miniature train operated over an extensive track, depicting a portion of an inter-urban line, set in motion actual block signals and high-

way crossing warning units, so that the public could observe the mechanism and operation of each type of signals.

Assembled in a row were typical track and paving sections used at different periods in the history of the electric railway in Milwaukee, all the way from the first rail types, consisting of flat iron bands on wood string-



An Angle on Rail Joints and Track Construction

A corner of Milwaukee's transportation exhibit during Open House Week was devoted to track details. Actual rail joints of various types used on the property were shown as well as photographs of actual track construction.

ers with open track or paving consisting of loose gravel, up to the present 151-lb. grooved and 102-lb. tee rail types in use today. The concrete or brick surfaced paving required under modern-day conditions was illustrated in section by looking through the glass end of each sample of track construction. Parts of car equipment were exhibited, opened up to show the interior workings. A complete working section of a one-man car 18 ft. long was set up.

WHERE JIMMIE WORKS

One of the features of particular importance on this property centers around the Employees' Mutual Benefit Association and the educational and other work accomplished by it. The educational department has just been moved to new spacious quarters on the fourth floor of the public service building. In the auditorium on the second floor, used for many E.M.B.A. functions, was shown a recently completed film entitled "Where Jimmie Works."

In this building the medical department is located and its many rooms and laboratories were open to the visitors. Members of the medical staff showed visitors how health is promoted among the employees and their families.

In the "thrift" exhibit it was shown that the employees of the company operate the third largest building and loan association in the State of Wisconsin, with total assets exceeding \$7,500,000. Of all the married employees in the company 80 per cent own their own homes.

Naturally the Cold Springs shops of the company, representing approximately \$1,000,000 of investment, were of interest. Work of car rehabilitation and overhauling was under way and the visitors could see the extensive processes used in the maintenance of equipment. At the Kinnickinnic garage spray cleaning, improved oiling

and greasing methods and oil reclaiming processes were demonstrated. The floor type of dynamometer used to give a bus an inside "road test" proved of interest.

In addition to these exhibits the company's substations and carhouses were open to the public, guides being provided to explain their use in providing service.

Of interest to electrical men was the new store for merchandising and servicing electrical appliances. Not only are units displayed, but the method of display, even to the type of show windows, has been worked out, to illustrate the possibilities to store owners in other lines of merchandising. An electrical house is not uncommon nowadays, but in the basement level of this new store is a permanent house completely fitted out in which architects and private home builders may seek advice and have demonstrated not only the most modern electrical equipment but the most modern methods of installation.

How to Get About in Montreal

"LITTLE Lessons for Beginners in French" might well be the cognomen applied to a handy route book just issued by the Montreal Tramway, Montreal, Que. You can take your choice. Pick it up casually and you will perhaps find yourself glancing through a complete outline of the company's tramway and motor bus routes—all purveyed in the most meticulous of English. Turn it over in your hand and again you will find the same information, but this time in fluent French. Phrase by phrase the contents of the "Siamese" booklets are identical, so that neither constituent part of the French-Canadian population may cry "Discrimination!" The larger share of the population of Montreal is of French persuasion. It was decided to carry out this unique idea of a dual booklet in order that the maximum of accommodation might be provided for all users of the tramway and bus lines. In addition to in-



Both Covers of the Montreal Route Guide Are Front Covers

formation regarding the various routes of the company, a number of hints to the traveling public are included on such matters as paying fares, entering and leaving cars, etc. The booklets are furnished free of charge to patrons of the tramway and bus lines.

Mr. Storrs Comments on Conditions in Europe

Managing Director of A.E.R.A. is Struck by Interest in Improved Rolling Stock and by Conviction on Part of European Managers and Public Officials That Complete Co-ordination of all Forms of Public Transport Is Essential to the Public Interest

BASED ON AN INTERVIEW BY

Charles Gordon

IMMEDIATELY following the strenuous work of preparation for the Cleveland convention, Lucius S. Storrs, managing director of the American Electric Railway Association, took a much-needed rest in the form of a brief trip to England, France, Germany and Italy. Although this was primarily for pleasure and rest, he took advantage of the opportunity to look over electric railway properties in the cities which he visited, and brought back a number of comments which should prove of interest to American operating executives.

Two primary things stand out from Mr. Storrs' observations. First of these is the conviction that seems to be general throughout Europe that the electric railway continues to offer the best agency for the basic transportation service of modern cities, supplemented of course by the bus in a large measure. Transportation executives both in London and the large cities of continental Europe have not only been giving careful study of the bus in their own and neighboring countries, but have also been watching its development in America through articles in the technical press and by personal trips of inspection to this country. In addition, particularly in London, Paris and Berlin, experience with the bus antedates, in some cases by many years, its extensive introduction in this country.

Having in mind the growing realization on the part of the public and the transportation companies in the United States of the necessity for a complete co-ordination of all means of public transport and the need for a more thorough understanding of the transportation problem on the part of public officials and the people generally, as well as the necessity for better understanding of the public's needs and viewpoint on the part of

transportation officials, Mr. Storrs noted particularly the progress which has been made in this direction in Europe. Here he was impressed by the strides which have been taken toward reduction of the waste, congestion and confusion produced by overlapping of transportation agencies and the obstacle to community progress which is caused by failure to consider all forms of public transportation from the standpoint of the community's needs as a whole.

In this instance Mr. Storrs found that we in America are not taking the leading position that we assume we are and on which we flatter ourselves. Throughout Europe there is an almost universal agreement on the need and advantages of co-ordination, and a determined interest by railway executives and public officials to effect such complete co-ordination of all public transport facilities as rapidly as possible, and solely in the public interest. Buses form an important part of the transportation systems, in small as well as large cities. But in each case they are co-ordinated so as not to duplicate in kind the service on rails. In providing service to sections of cities not reached by railways, and on streets where the character of the thoroughfare would make

rails undesirable, they are performing useful and efficient service. In such cities as Nice, Genoa, Rome, Florence, Bologna and Munich buses are operated, but they have been co-ordinated with existing rail lines.

As a result of their experience and observations, Mr. Storrs found transportation executives, and city officials as well, convinced that adequate transportation facilities for their cities and the proper co-ordination of buses is dependent on intensive development and modernization of the electric railway systems. To this end extensive programs of improvements are under way, and



LUCIUS S. STORRS
Managing Director
American Electric Railway Association

many experiments are being conducted for the purpose of developing improved forms of rolling stock.

Like all American visitors to Europe, Mr. Storrs was struck by the comparative quietness of foreign rail operations. This he attributes to the high standards of track and equipment maintenance. In comparison with American conditions, he found this to be a point of marked superiority. Operating speeds in Europe, however, he found to be generally lower than in this country, and the introduction of one-man operation has lagged both because of the difficulty of fare collection under the zone system so generally in use and also because of the lower scales of platform wages.

Another feature with which he was impressed was the general adherence to electric braking. He was of the opinion that this increased the weight of motor equipment required and also held back the introduction of air-operated door equipment for inclosed cars. To this he attributed some measure of the responsibility for low schedule speeds.

The progress made in car improvements in Berlin and the extensive program of modernization there was the subject of particular observation and comment. Since the war approximately 25 miles of new rail lines have been built. Introduction of all-spring suspended motors and totally-inclosed bevel gear drive, with the gears immersed in oil, has passed the experimental stage and has been adopted as a definite design practice. He found the management of the Berlin surface car lines enthusiastic over the results obtained with this form of construction and considered the subject of similar improvements, one to which American operators and manufacturers could well afford to give increased attention.

An extensive program of car modernization is already well under way in Berlin. This includes attention to the matters of car appearance and other features to make the service more attractive to riders. A similar appreciation of the advantages of car improvement was evidenced in discussions with railway executives in other cities in continental Europe and in London.

Still another feature of Berlin and Paris practice is the definite commitment to single-deck cars. The management there has become convinced that the double-deck car, while it seems to afford more seats per given unit of street space and track capacity, is so slow in loading and unloading as seriously to cut down schedule speed. The net result is that all traffic is slowed down to an extent which cuts the effective transportation capacity of a given line below that obtained with single-deck equipment, when advantage is taken of modern methods for increasing the speed of passenger interchange.

Mr. Storrs was further impressed by the general use in Europe of anti-friction bearings, and the satisfactory results reported for them. In some cases, experience has extended over a number of years, and in Berlin roller bearings have been adopted as standard for all new equipment. In Paris the practice is to use ball bearings. Approximately 1,000 new cars have been put in service in the German capital, replacing older, heavier and less attractive equipment. These consisted first of four-wheel motor and trail cars, having two axle-mounted motors on one car. These are being changed so that there will be one motor on each car, driving both axles through bevel gears, and with the two cars permanently coupled to permit double end operation. Wheel brakes are being abandoned in favor

of clasp shoes on axle disks or armature mounted drums.

In London two new types of double-deck surface cars are being developed with a primary view to increasing schedule speed through the provision of more ample facilities for the rapid interchange of passengers. These cars are also being designed with a view to decreased weight and increased attractiveness through the application of automotive ideas to car design.

Paris, likewise, is giving close study to car development with a view to improving the character of service rendered. In that city and in Berlin the cycle of car design has been similar. Early single-truck cars of short wheel base were followed by double-truck cars of considerably increased weight. The latest practice is in the direction of four-wheel cars of comparatively long wheel base, with oil tight bevel gear drive.

Chicago "Tribune" Defends Safety Island Regulations

COMMENTING editorially on a tour of investigation recently taken by its automobile editor, J. L. Jenkins, the Chicago *Tribune* declares that not one motorist in three pays any attention to safety zone regulations at electric railway loading points. The *Tribune*, which has been conducting a vigorous campaign for many months against the incompetent and careless motorists, pointed out that loading point safety zones have two functions—they protect those boarding or leaving street cars and they speed up motor traffic by permitting automobiles to pass a street car halted to take on or discharge passengers. Drivers are called upon to remember that they are being benefited as well as the pedestrian car rider. The writer continues as follows:

There is no safety in a safety island if motorists disregard the rules. Safety islands are safe only when the law is respected 100 per cent of the time. Otherwise the pedestrian's trustfulness merely exposes him to accident.

Safety islands, in the matter of the faith commonly placed in them, rank with boulevard and through street stop signs and traffic lights. People do not trust in speed laws, in headlight laws, in the rules concerning the passing of vehicles, the crossing of streets, or turning corners. They do, however—drivers and pedestrians—trust in stop signs and lights and in safety islands. Violations of these rules should be prosecuted, accordingly, with the utmost vigor.

The tendency to get away with something does not stop at safety islands. A trip on the boulevards is enough to show that drivers are failing to stop or slow down adequately at stop signs; that some of them habitually sneak through the traffic lights. For cars to start up on the yellow light instead of waiting for the green is an almost universal practice; the man who waits for the green received as his reward a raucous chorus of horns from that particular type of boor behind him.

Ganz Develops Single-Phase, Three-Phase Locomotive

ENGINEERS of the Ganz Works at Budapest are developing a type of electric locomotive capable of taking energy from a high-voltage, single-phase overhead conductor and converting it on the locomotive into low-voltage, three-phase current for use in the motors. Two locomotives of this type have been built for the Austrian Bundesbahn for main line service. They weigh about 80 tons each and are rated at 3,200 hp. capacity. A third locomotive of this type is being tested on a 9½-mile section of the Budapest-Vienna line. The Ganz company has also recently built two 3,500-hp. d.c. locomotives for the Paris-Orleans Railway in France.

Co-ordinated Transportation Proposed for St. Louis

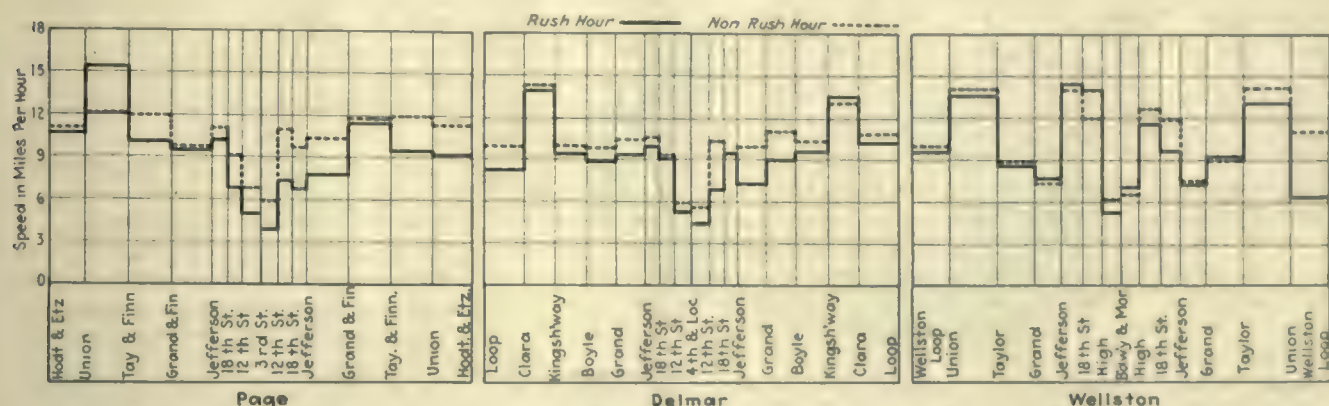
SECOND ARTICLE

Importance of Higher Car Speeds Stressed and Means Suggested for Gaining Them—Buses Will Not Supplant Electric Cars in Mass Transportation and Are Expensive Substitutes—High Buildings Aid Rather than Impede Better City Transit—Means Outlined for Caring for Future Traffic Needs by Rapid Transit Trains, Buses, Electric Cars and Private Automobiles

IN the issue of Dec. 11 an account was given of the present transportation agencies and transit situation in St. Louis, as outlined in a report prepared for the Board of Aldermen of that city by E. R. Kinsey, president of the Board of Public Service, and C. E. Smith, consulting engineer, St. Louis. The second part of the report analyzes the possibilities of improvement

25 years ago and has not been increased appreciably since that time. The street car must get in step with the rapidly changing situation and speed up. This can be done in various ways.

In congested business districts where traffic is sufficiently dense to support the investment in underground construction the speed may be raised by running



Average Speed of Cars on Three Important Radial Lines in St. Louis. The Great Difference between Uptown and Downtown Schedule Speeds Is Very Noticeable

by higher speeds for the surface cars, the use of buses and rapid transit lines and rerouting. An interesting topic considered in this portion of the report is the effect on city transportation of high buildings. While indorsing the principle of decentralization to the extent to which it can be done by the removal outside of the congested center of business or trades which can be transacted as well or better elsewhere, the report declares that transportation problems are simplified when the area of the main business district is kept comparatively small by the erection there of high buildings.

An abstract follows the second part of the report. The first topic considered in this part of the report is car speeds.

SPEED OF STREET CARS

Before the advent of the automobile, the street car was the fastest means of transportation for use in cities not having rapid transit facilities, and it still is and will continue to be, when properly co-ordinated with bus service, the preferred vehicle for mass transportation. But people are less tolerant of slow motion than ever before and the average of 10 m.p.h. made by the city street cars is no longer attractive. It is noteworthy that the present speed of street cars was reached

the street cars in subways. But speeds just as fast may be made at much less expenditure on the surface outside of these districts.

SLOW SURFACE SPEEDS BECOME OBLIGATORY IN CITIES

As the districts in which the faster lines are located become built up, the conditions approach those of the slower lines, and the speed will likely decrease. It is necessary for those lines that are paralleled by smooth improved roads on which automobiles and competitive buses may make high speeds to increase their speed. Otherwise the traffic will pass to the fastest means of transport on the public roads.

Car speeds in cities vary from approximately 25 m.p.h. by the express trains of the New York subways down to 3 m.p.h. on the street surface of congested business districts. In St. Louis different speeds are found in various parts of the city under different conditions, as shown in Table I.

Generally speaking, the average car speed in St. Louis is 9½ to 10 m.p.h., while in Cleveland the average speed is 10½ to 11 m.p.h., about 10 per cent faster than in St. Louis. The higher speed in Cleveland is due partly to wider streets and partly to the co-operation of the public, the street railway company and the public

TABLE I—ELECTRIC CAR SPEEDS IN ST. LOUIS

	Miles per Hour
Congested business districts.....	4
Congested business districts, evening rush hour.....	3
Streets of ordinary width outside congested districts.....	8-9
In wide streets.....	10-12
In reserve strips at center of roadway separated by curbing from other traffic.....	13-15
In reserve strips alongside city streets:	
(a) When separated by curbing from other traffic.....	14
(b) When paved over and used by other traffic.....	13
Express service on private right-of-way with separated crossings.....	25

authorities in avoiding unnecessary use of street car space by other traffic. In addition, all streets with car tracks have been made boulevards in Cleveland and other traffic must stop before crossing. Careful planning has been given to street car speeds in Chicago and Detroit.

A great deal of the slowing down, especially in the rush hour, is due to the frequent stops. A great deal of

town end of the line is less than at the outlying ends. Where tracks are located in reservations of the streets and do not have to mix with the other traffic the speed is from 3 to 4 miles above the average.

The remarkable slowing down of street cars in the congested area causes a great accumulation of cars there during the rush hours.

Another way of showing car speeds is by a time contour map, and such a map, reproduced from the report, is shown. It has been calculated from actual speeds during the evening rush hour, the time being taken from the Federal Reserve Bank at Broadway and Locust Street, and a walking time at the rate of 3 m.p.h. has been allowed. Whenever a transfer from one line to another is made one minute is allowed for the change of cars. It is assumed that the fastest route has been taken in each instance.

A second time contour map is reproduced to show the time zones after the second step of rapid transit construction, recommended later in the report, is taken. It shows a saving of approximately twenty minutes to all parts of the city and that 90 per cent of the city population will be within a 30-minute ride of the center of the city.

MAINTENANCE OF SCHEDULE IMPORTANT

The maintenance of regular schedules is as important as faster speed, but, by reason of interference of other traffic, schedules are easily interrupted. Time checks on busy lines in St. Louis showed that time gaps between cars several times the scheduled headway are quite frequent. To show how great is the variation of the actual speed of the schedule and to show the delays

in service car performance charts have been drawn for a number of lines. Such a chart for the Delmar line is given on page 1135. It shows the movement of all cars on the line during the day from 6 a.m. to 10 p.m., the slope of the line indicating the speed of the car between any two points. In this chart, lines with dots indicate two-car trains.

Because of the large number of cars on this line the observers were unable to time cars in both directions at once, and so timed eastbound cars on one day and westbound on the next. This accounts for the fact that the delays do not run across the chart. The worst delay shown was a fifteen-minute tie-up of the eastbound cars between 5 and 6 o'clock in the afternoon. The delay just east of Twelfth Street, due to traffic, frequent loading and unloading points, is clearly shown by the upward slope of the lines at this point.

The establishment of express service by the street cars and local service by buses will speed up the service marvelously. This could be worked out very nicely on the east and west lines and on some of the north and south lines. This bus service for local passengers need not be on the same street as the car line if it made junction with it at the express stops. If the street having the car tracks should be made a boulevard so that all cross traffic would have to stop and give the cars the right of way very good speed could be made.

Another method of increasing the speed of cars is



Present Time Zones from the Business District During the Evening Rush Hour
by Existing Means of Communication

St. Louis is subdivided into small blocks, about 16 to the mile. When cars make that many stops the convenience of the greatest number is sacrificed to that of the few who desire to secure street cars by short walks. If the cars made only eight to ten stops per mile the longest distance from the stop measured along the car lines would be 300 ft. The length of the average walk would be increased less than 5 per cent, but the speed of street cars would be materially increased.

The diagram on page 1131 shows the average speed of street cars on three of the principal radial lines entering the business district. The average number of passengers per mile of single track per year for the six years 1920 to 1925 for these three lines were: Delmar, 1,213,000; Wellston, 1,200,000; Grand, 1,097,000. In these diagrams the full lines show the speed during the rush hour and the broken lines the speeds during the non-rush hours. Speeds during the non-rush hours are usually faster, as indicated by the broken lines being above the full lines in almost every case. Where the opposite occurs the cause is due either to light traffic or to cars hurrying to make up time lost in congested districts. In each of these diagrams the outlying ends of the lines are at the extreme right and left of each graph and the downtown portion in the center; that is, each graph shows a round trip. In general, the speed through and approaching the down-

by a thorough revision of the present car routes. In many cases lines can be rerouted, and while still serving each district adequately, the speed of the line can be increased by reducing the number of turnings and crossings. A suggested rerouting plan forms part of the report.

MOTOR BUSES WILL NOT SUPERSEDE STREET CARS

The advent of the motor bus as an agency of mass transportation is the biggest change that has happened in surface transportation in cities since the coming of the electric car 35 years ago. Among men not expert in transportation matters the idea is prevalent that the day of rail transportation in city streets is gone. But men who have made a lifetime study of rapid transportation, including those who have had most experience in operating motor buses, do not share that view. They are firm in their opinion that the motor bus will never successfully handle mass transportation in large cities. This is true except possibly under a system of rapid transit with motor bus feeders and auxiliaries.

The consensus of opinion seems to indicate that there is no place in any city except possibly the few very largest cities for the motor bus in competition with the street railway, because such competition inevitably renders adequate service by the street railway impossible, if it does not actually ruin it, while after the ruin takes place the motor bus cannot handle the load, particularly during the rush-hour peak.

The motor bus, however, can be of inestimable value as an adjunct to the electric railway when accepted in the proper spirit as supplementing rail service and providing a class of transportation that many people desire, even at a higher cost. In cases of this kind they should be provided with that transportation to the extent to which it can be provided at the price they desire to pay for it, but it should be established as a co-ordinated branch of the street railway service and not in competition with it.

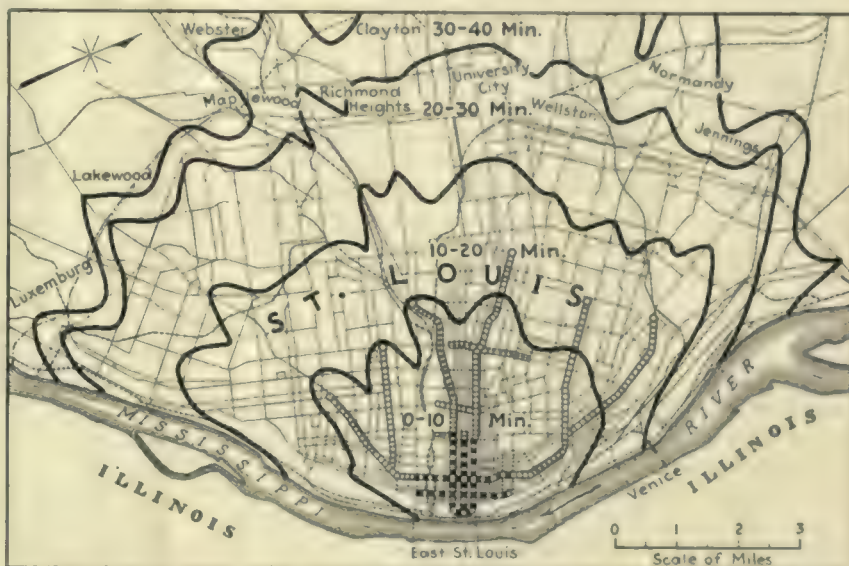
It is surprising what a large element of the population, even including men of large affairs and a big business, believes that competition in city transportation is beneficial and tends to reduce cost. Of course it is axiomatic that to the extent to which competition brings about unnecessary duplication of service the cost will be increased, and the inevitable result will be an increase in street car fare. When buses are operated as a parasite on the street railway system, reducing the profits on the profitable lines, the ability of the latter to carry the unprofitable street car lines is reduced to such an extent that fares must be increased or service reduced over the entire street railway system.

DIFFERENCE BETWEEN 7-CENT AND 10-CENT FARE

A sociological question is involved in the difference between a 7-cent street car fare and a 10-cent bus fare. The difference between these two rates means an average increase for transportation of about \$50 per year per family. No doubt in any community 5 or 10 per cent of the families can easily absorb such an increase, but the great multitude of the families cannot

contemplate or undertake with equanimity an increase of \$50 in the family budget. To avoid that, the cheaper means of mass transportation by street cars in the larger cities must be continued with full vigor and at the least cost. This cannot be done if they are subjected to unregulated competition of favored subsidized motor bus lines.

The extent to which motor buses in St. Louis have been favored and subsidized is indicated by the fact that they are permitted to charge a 10-cent fare while the street railways are limited to a 7-cent fare. The street railway company contributes to the city about 12 per cent of its gross revenues in various forms of taxation and paving costs, the motor bus company approximately 4 per cent. The motor bus company is not compelled to provide any particular quantity of service during the rush hour, but is permitted to



Time Contours After the Second Step of Rapid Transit Recommended Has Been Made. Here Practically the Entire City Is Within the 30-Minute Time

choose the number of passengers for which it is willing to provide seats; the street railway is compelled to provide a fixed number of seats and a fixed area of standing room for all passengers and carries the burden. The motor buses wear out pavements provided by others; the street car company pays for pavements used by others. There is no obligation on the bus company to continue service on any line.

The speed of the buses on the lines in St. Louis radiating from the primary business district is a little slower than the street cars. The buses average about 9 to 9½ m.p.h., the street cars nearly 10 m.p.h. But because the buses do not run as frequently as the street cars, the longer time spent waiting makes the trip take still longer. The map which appears on page 1136 shows the present street railway and bus lines in St. Louis.

Before the advent of the buses in St. Louis the 7-cent fare of the street railways was adequate, and without bus competition would be more than adequate today. But with the competition, principally because of unnecessary and wasteful duplication of service, neither company is making money. The bus fares cannot be raised. Under present riding conditions it is possible that the street railway company can be made whole by an increase in fare, and if that causes traffic to be diverted to the bus company, possibly both would be

TABLE II—SUMMARY OF TRAFFIC COUNT INTO AND OUT OF BUSINESS DISTRICT

	10 A. M. to 4 P. M.			Maximum Hour (P. M. Peak) Leaving District One Way			Entire Business Day 7 A. M. to 6 P. M. (Both In and Out)		
	Per Cent of Total Vehicles	Passengers	Per Vehicle	Per Cent of Total Vehicles	Passengers	Per Vehicle	Per Cent of Total Vehicles	Passengers	Per Vehicle
Street cars.....	7.5	55.4	28.5	8.3	72.9	73.5	9.6	63.5	32.7
Private automobiles..	89.7	36.4	1.6	89.4	20.1	1.9	87.3	28.8	1.6
Buses.....	2.0	7.9	14.3	1.2	6.4	45.2	1.9	7.2	18.0
Service cars.....	0.8	0.3	1.5	1.1	0.6	4.4	1.2	0.5	2.2
Total or average.....	100.0	100.0	3.8	100.0	100.0	8.5	100.0	100.0	4.9

on a better basis. But that step would be a direct penalty of a higher fare against the 90 per cent who ride in street cars in order that 10 per cent may ride the buses at still higher fares.

Notwithstanding the harm that has resulted to the United Railways from motor bus competition, the motor buses have come to stay, and when the unnecessary duplication of routes and service is ironed out the ultimate result will be beneficial.

MOTOR BUSES ARE EXPENSIVE SUBSTITUTES

It might be argued that if electric car lines could be suspended and the entire traffic thrown to the motor bus lines, the latter could succeed. The evidence all seems to indicate that under such conditions the motor bus service would result in higher fares. Having no fixed property there is no assurance of the continuation of all the bus lines, particularly the non-profitable lines. To the extent to which the newer means are justified, they should be adopted by the electric car company.

HIGH BUILDINGS IN PRIMARY BUSINESS CENTER VERSUS DECENTRALIZATION

Is it better to permit buildings to go to any limit, as in New York, Chicago and most other large cities, or to restrict the height as has been done in Boston for 25 years? The statement has frequently been made that it is impossible to provide transportation for the congested section of Manhattan Island. The real trouble is that transit facilities there have not been provided in pace with other developments and the increased business is served by facilities built for lesser businesses.

For about 25 years Boston has had a stringent law restricting building heights to slightly over 100 ft. This has caused the business district to spread over a large area and apparently has brought into the district many automobiles for transacting business which might not have been needed if business were transacted in a smaller area. There is nothing in the Boston situation that would indicate that the restriction of building heights has ameliorated the traffic congestion there. Quite the contrary may be assumed, for recently the building height restrictions have been raised.

It is worthy of discussion whether traffic congestion is increased more by high buildings than by the increased travel made necessary when business is transacted in smaller buildings spread over a larger area. Certainly the cost of transacting business over a larger area is more expensive and raises the question whether concentrated business or traffic congestion shall control.

To minimize the amount of expensive rapid transit construction in large cities, it does not seem logical to keep the congested districts small and to concentrate the business and improvements there by permitting the maximum number of large buildings.

Decentralization has been suggested by many as one permanent solution of the traffic problem; that is, the development of a number of secondary business districts. This is apparently taking place to a greater extent than ever before, as a study of any large city

will show, but there is no indication that it will materially decrease the importance and expansion of the main business center, where most of the congestion troubles are. There is no doubt that decentralization will result in increasing the amount of automobile traffic in the various centers, while at the same time street car travel will also be increased correspondingly, and means will have to be provided to furnish mass transportation among them.

Traffic conditions in the congested centers can be relieved by moving out of them certain lines of business or trade that can be transacted as well or better elsewhere. This has been done with the fruit and produce business in Chicago and has been proposed in New Orleans. It should be done in St. Louis.

With subways into the St. Louis primary business district it would be possible to move several times as many people in and out as are now being moved on street cars, but underground sidewalks would be needed along all streets having subways, and probably along all streets in that district.

Further development of the congested downtown area will depend in part on relief from automobile congestion as well as on the solution of the transit problem. With street cars removed, the streets will be available for trucks, private automobiles and pedestrians. But private automobiles must have somewhere to stand elsewhere than on the streets. Garages contiguous to the edge of the business district will help materially, but when a quarter to a half mile away from one's place of business are not altogether satisfactory. To provide for them, there should be a separate floor in every large building built in congested areas. This is believed preferable to the provisions of large open parking spaces around the edges of the primary business district.

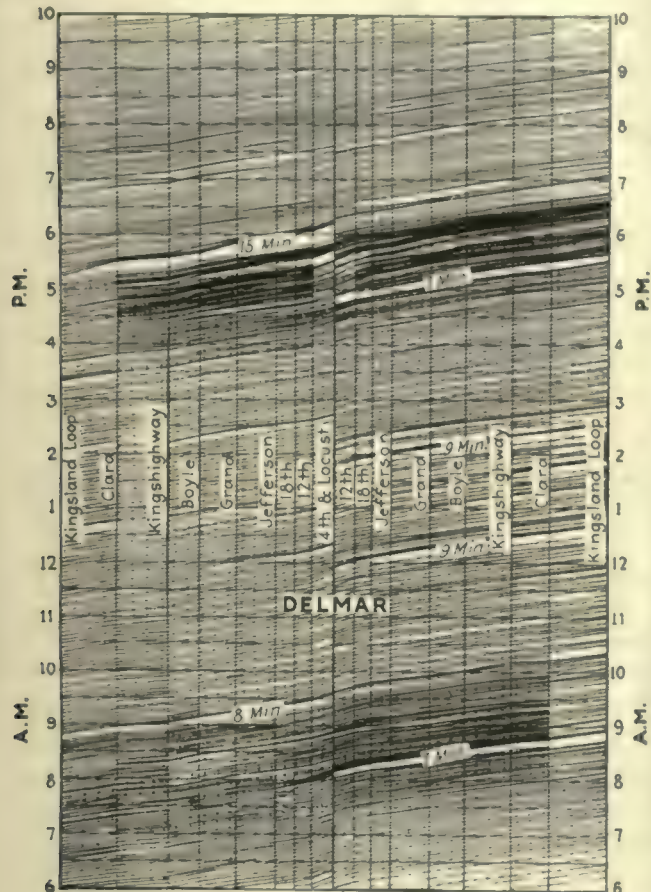
RELATION BETWEEN STREET CAR AND AUTOMOBILE TRAFFIC IN CONGESTED DISTRICTS

The number of automobiles and automobile passengers entering and leaving the downtown congested district in St. Louis was counted on several normal days during August and September, 1925, in order that a comparison might be made between the occupancy of streets by automobiles, street cars and other traffic and the number of passengers carried by each. Altogether, during the entire business day from 7 a.m. to 6 p.m., 100,509 passenger vehicles and 37,850 commercial vehicles entered or left the business district. Of this number 10,399 passenger vehicles and 2,722 commercial vehicles left the business district during the maximum hour in the afternoon peak. Table II shows the percentages of vehicles during the non-rush hours and afternoon rush hours as well as during the entire day with average number of passengers per vehicle. This table proves that where the bulk of the transportation business at all times is done by the street cars, they carry a greater percentage during the rush hours than during the non-rush hours, and that the motor buses do not carry as large a percentage of the rush-hour traffic as during the remainder of the day.

In other words, the street cars lose most business at

times when they have ample capacity to carry it and to furnish seats for every passenger. It is lost during non-rush hours when schedules are at a minimum and headway at a maximum and consequently when service may not be decreased proportionately without further loss. The only possible cure for this is to speed up the service and make it more attractive.

These traffic studies show very decidedly that some remedy to the present situation must be applied if traffic



Running Time Graph of Cars on Delmar Line, Showing Irregularity of Schedules in Morning and Evening Rush Hours in Downtown District

is to be kept moving at all. In the congested district the solution is to place the agency for mass transportation—that is, the street cars—on a separate level of the street, underneath the present level, and in the out-sections of the city to place them in reserved strips in the center of boulevards or on separate levels either above or below the present street surface.

Another reason for the separation of traffic is that, although the passengers carried by street cars are greatly in excess of those riding in private automobiles, it must be admitted that in purchasing power and presumably from other standpoints, the automobile riders are of more importance to the primary business district than their numbers would indicate.

EFFECT ON CAR SPEED OF PARKED AUTOMOBILES—PROHIBITION OF PARKING CONSIDERED

The survey discloses that the street cars are seriously handicapped in their movements and slowed by the congestion caused by parked automobiles. It does not seem to be a proper use of the streets to permit automobiles, which carry only a small per cent of the public, to occupy the streets so as seriously to interfere with the 60

to 75 per cent of the people who must be carried on street cars. As the survey showed reserve parking capacity outside the congested district, the remedy would seem to be to permit parking for 30 minutes to one hour, and to have parking places convenient for those who want to remain longer or all day. This might lead to each large building assigning the entire basement or an upper floor to automobile parking.

The time consumed by street cars in round-trip routes or through runs through the congested business district was checked with and without parking of automobiles during rush hours.

The first count was taken early in 1925, during which time automobiles were permitted to park at the curb for a period of one hour, and the curb space was always fully occupied during the rush hour. The second count was taken in September, 1925, after regulations had been in effect for several weeks prohibiting all parking within the district between 4:30 and 6 p.m. The regulations were well enforced and the curbs were kept clear of automobiles. The time in minutes spent by all cars in the district was reduced from 264 to 247, a reduction of 6.5 per cent, amounting to a saving of 0.9 minutes per car. The speed in miles per hour was increased from 5.29 to 5.54, an increase of about 4.7 per cent.

Even under the more favorable condition of no parking, the actual speed was about 10 per cent slower than the scheduled speed, due to delay caused by more moving automobiles during the rush hour and to the time spent in taking on passengers.

If it be a fact, as retail merchants have complained, that the complete prohibition of parking has an adverse effect on business, the slight advantage of moving street cars through the districts at an average of one minute faster would not seem to justify irreparably damaging the merchants, and parking during the rush hours might better be continued for their benefit under regulations that would avoid delay to street cars.

Automobiles should not be permitted to park so close together as to delay other traffic when getting to and from the parking space to the curb. This can be accomplished by marking berths for automobiles 5 to 6 ft. longer than the average automobile. This would seem to be preferable to the entire prohibition of parking at any time. On the other hand, there is no justification for all-day parking anywhere in or around congested districts.

MOVEMENT OF AUTOMOBILES ON STREETS WITH AND WITHOUT CAR TRACKS

A count of automobile traffic in and out of the congested districts shows that the automobile capacity of a street with no car tracks is greater than that of one with car tracks, and other studies indicate that the presence of street cars on any street reduces the capacity of the street for other traffic. This indicates the desirability of concentrating street cars on the fewest possible streets. By doing so, the streets not used by street cars can handle more automobiles at faster speeds, while the avoidance of the street car streets by automobiles—which is possible when adjacent streets are free of street cars—enables the street cars to move faster, due to less interference.

The concentration of street cars on the fewest streets practicable also permits better automatic traffic control to be adopted on those streets without street cars. Street cars in narrow streets in the congested districts cannot be adjusted satisfactorily to automatic traffic

control because the loading and unloading of passengers control their "stop and go" periods in an irregular manner that cannot readily be synchronized with automatic signals.

RESERVATIONS FOR STREET CARS OUTSIDE CONGESTED DISTRICTS

Freedom of movement and relief from congestion increase with the width of streets. With 100-ft. widths further improvement may be made by dividing the roadway into three parts and providing a fast right-of-way for street cars, curbed off in the center, and one-way roadways on each side. This will provide for the separation of vehicles at different speeds, the faster automobiles close to the street car curbing, slower moving vehicles next and cars parked at the curb. On streets of sufficient width, where car tracks are located in reservations and where the density of traffic is sufficient, street cars may be operated express and local

Use as few streets as possible so as to free others of car tracks in favor of automobile use.

Assemble car lines in a manner that will permit their deflection into downtown surface car subways when built, with the least rearrangement.

Loop east and west lines as far east as possible and loop north and south lines through streets as far east as possible. The latter plan offsets in part at least the tendency of business in St. Louis to drift westward and has the additional advantage that the north-and-south lines cross the east-and-west lines where traffic is lightest. Loops and turns in the business districts should be kept at a minimum and left-hand turns eliminated as far as possible.

PROPOSED RAPID TRANSIT LINES

It is recommended that the first step in the construction of rapid transit facilities in St. Louis be the building of street car subways in the congested districts, as



Map of St. Louis, Showing Trolley Car and Bus Routes

service rendered by buses interchanging passengers with the street cars at important intersections, as already explained. As street car riders constitute about 75 per cent of the traveling public, there is every reason why at least one-third of the roadway should be assigned exclusively to them on streets that are wide enough.

REROUTING

The rerouting of street railway lines in St. Louis in the past has been handicapped by the requirements of old franchises and mortgage obligations, which it is expected will be virtually wiped out by the present financial reorganization and a new modern franchise. In such rerouting the following policies should be kept in mind under St. Louis conditions:

shown by the heavier check lines in the time contour map for the future on page 1133. These subways should be built near the surface of the street, especially at stations. They will be of steel and concrete and contain two tracks. Parallel underground sidewalks should be built in the subways as part of the structure. Each subway will take up nearly the entire width of the 60-ft. street and the stations and underground sidewalks will have to be built inside the property line. These subways will be built for surface cars in the first instance, but will be so designed that when extended in the future they may be used by rapid transit trains.

Such a plan would have notable advantages over a single rapid transit line, such as one through the city from east to west. Such a route would stimulate fur-

ther intensive development along a narrow strip, whereas the plan proposed would not favor any one section of the city to the disadvantage of the others and would solve the entire street car delay problem in the congested districts. Thus, by improving the service equally to all sections, it would encourage the orderly utilization of all undeveloped areas within the city. Finally, cars used in the rush hours, to the number of 200, could be stored during the day at the riverfront instead of making return trips practically empty. This would amount to a saving of 2,000 car-miles per day.

The riverfront property between Washington Avenue, the levee, Market Street and First Street would be developed by the construction of a plaza with three track levels. On the first floor, a safe distance above the flood height of the river, would be the rails used by the Olive Street cars. On the second floor would be the Market Street cars and the elevated railroad tracks on the levee. On the third floor would be the Washington Avenue cars, about level with the railroad tracks on the Eads bridge. The roof of this building would be level with the upper or highway deck of the Eads bridge and should be connected with it and finished as a riverfront plaza.

SECOND STEP IN RAPID TRANSIT PLAN

In the second step of the rapid transit plan trains would carry practically all the heavy traffic. The lines would extend radially from the primary business district to various points, conveniently located for the assembling and distribution of passengers in such a way that the rapid transit lines would be assured of traffic sufficiently dense to justify their cost. These rapid transit lines would handle the business of several street car lines and the street cars would no longer handle the crowds downtown. The suggested routes are shown by the lighter check lines in the map on page 1133. The third and final step would consist of extending the rapid transit lines to the city limits and would involve a system with 28 miles of lines. When this step is completed the city limits would be only twenty minutes from downtown during the rush hours, instead of about one hour as at the present time.

It is expected that the first and second steps, involving the expenditure of \$36,000,000, could be completed and in operation within five or six years. This sum is exclusive of about \$12,000,000 for tracks, electrical equipment and cars for the operation of the line. This sum would be supplied by the operating company, unless the city should decide to finance this cost.

The time when the third step would have to be undertaken will depend on further developments, following the completion of the second step. The third step comprises 28 miles of line and its estimated cost is \$52,000,000.

In the second and third steps it is contemplated that passengers will transfer between street cars or buses and the rapid transit lines. This would be necessary, as only a small part of the people would be within convenient walking distance of the rapid transit line. Regular transfer across a platform under cover, or in some cases at different levels, is recommended. This plan has been followed for more than 25 years in Boston and for nearly twenty years in Philadelphia with great satisfaction.

The outlying ends of the six rapid transit lines during the second step, and also after the third step, will be important transfer points and secondary business

centers. At these points automobile parking space should be provided at nominal cost for people who prefer their own automobiles to street cars or buses beyond the rapid transit lines but desire the benefit of the latter. These parking areas will further decrease the parking problem downtown.

The 7½ miles of line proposed in the first step are in congested streets and subways are necessary, but the lines proposed in the second and third steps may be either subways or elevated.

"Trolley Bargain Day" in Toledo

Co-operation with Railway and Merchandising Officials on Store's Anniversary Results in Profits for Both—Checks Show Trolley Way the Best Way

"SORRY, madam, we can't accept any fare this trip. Your ride is free, by compliments of New Milner's Anniversary Sale." Such Chesterfieldian greetings to railway and bus patrons of the Community Traction Company, Toledo, Ohio, found neither unyielding nor unprepared riders, as "trolley bargain day" on Oct. 15 had been avidly awaited. For had not all citizens devoured the extravagant street car posters announcing the gala event and all true shoppers and housewives scanned the front page news stories with promises of free rides and half prices? Who among Toledo's

THE COMMUNITY TRACTION CO.

New MILNERS ANNIVERSARY SALE TICKET

GOOD ONLY FOR ONE OUTBOUND RIDE ON STREET CARS OR BUSES, MUST BE PRESENTED BY PASSENGER BOARDING CAR NOT LATER THAN 4 P. M. FRIDAY, OCTOBER 15th, 1926.

Book No. 100

Ticket No. 4

Replica of Free Ticket Presented by Passengers Homeward Bound Whose Store Purchases Were in Excess of \$1

womanhood would miss an opportunity to "save with safety at New Milner's"?

This merchandising act, new in the history of Toledo, honored the occasion of the first anniversary of the New Milner's store, the largest department store in Toledo. Under the plan formulated by James A. Greig, sales manager of the Community Traction Company, New Milner's purchased the entire inbound business of the company between the hours of 9 and 10 on the morning of Oct. 15, during which time the fare boxes were covered with canvas hoods. But that's only half of the story. The store also offered each customer who made a purchase of \$1 or more a free ticket good for one return or outbound ride. The only restriction on this free return ride ticket was that it had to be used before 4 p.m. on that day. This reservation was interpolated to avoid shopping in rush hours, thus throwing the entire burden of the special transportation stunt into the off-peak hours. The outbound ride ticket was festive looking in its yellow, black and red coloring.

Whatever this advertising stunt revealed in the way of business acumen and efficient management, it also was evidence of the deep appreciation which New Milner's felt for the residents of Toledo who had given their patronage so faithfully during the past year. To the store's executives, a fitting way to express such

thanks seemed to be found in an appeal to the ladies—free transportation with an opportunity afforded to acquire Axminster rugs, Jap rose toilet soap and black satin charmeuse at specially reduced prices.

In the hectic rush to buy there were some quiescent moments when perhaps the name of the late W. L. Milner was mentioned. He it was who first conceived the idea of the store before G. W. Kidwell, W. P. Emery and Carr Whipple assumed the management a year ago. Oddly enough, this man Milner was also interested in transportation, an evidence of which was noted in his heading a commission which drafted and sponsored the service-at-cost franchise under which the Community Traction lines are operating. His association with both transportation and merchandising endeavors added a certain glamor to this occasion.

But whatever the reasons, the realization of this "trolley bargain day" soared above the anticipation, for when the feverish excitement had died down and emergency policemen had retraced their steps to quieter walks of the city there was still something to shout about, for New Milner's "sale of deeds, not of years" had found many willing buyers and had boosted the trolley way as the ideal way.

After arriving at the reasonable charge for the leasing of the railway system the amount of normal riding was multiplied by two, as it was presumed the free car ride feature would attract greatly increased patronage. This forecast proved accurate as special service was required on several lines to handle the general increase in riding. In addition, many interesting disclosures were made in this hour of wholesale riding.

Checks made by the Community Traction Company showed that 91 per cent of all persons getting off street cars at the corner of Jefferson and Summit Streets went directly to Milner's store during the special hour between 9 and 10 o'clock. This compared with 20 per cent who went there the preceding Friday at the same time. The total number of persons getting off at that corner during the hour was six times as great as on the previous Friday, and 54 per cent of all passengers riding on Summit Street got off at that intersection. Another tally showed that 1,746 persons entered the store during the special hour, as against 292 persons at the same time the preceding Friday. Unloadings at other important merchandising corners also showed a decrease of 32 per cent compared with the preceding week's checks. On Oct. 16 the check of coupons turned in showed approximately 1,800 issued by the store. An analysis made by the traction company also indicated to the store the exact neighborhoods from which the bulk of its business was attracted. These figures were furnished to the store heads and the results indicated that most of the riders in that hour were Milner's-bound.

"The results exceeded our most optimistic predictions," announced Carr Whipple, executive of the store, following the day's sale. "Certainly the results are a definite proof of the fact that Toledo citizens appreciated the courtesy." More effusive was J. Frank Johnson, vice-president and general manager of the railway, who said that Toledo could well be proud of the distinction that the whole enterprise was an indication of what could be accomplished by real co-operation. "Department stores have long recognized the fact that the great majority of their patronage comes by street car," Mr. Johnson continued, "but this is the first time that a definite check, showing just how much this

patronage amounts to, will be available." He added that the results would be closely followed not only by the railway management but by Milner's also.

And now it is being bruited about that Milner's and the Community Traction will—yes—repeat the "trolley bargain day." Meanwhile other department stores in the city are making anxious inquiries on the cost of such service.

A Story Without Words



EFFECTIVE contrast, as shown in the accompanying picture, was recently used by the Utah Light & Traction Company to teach its platform men the desirability of neatness in personal appearance as a means of cultivating the good will of the company's patrons. An impressive story, without words, was told by the poster containing these pictures, of large size, displayed prominently in the trainmen's quarters at the carhouses in Salt Lake City.

Statistics of Interstate Electric Railways

DURING the early part of December, 1926, the Bureau of Statistics of the Interstate Commerce Commission made public its annual schedule of statistics of electric railway companies doing an interstate business. Altogether there are 260 electric railway companies which report to the Interstate Commerce Commission. The largest, in total operating revenue during the year, was the Pacific Electric Railway of Los An-

STATISTICS OF INTERSTATE ELECTRIC RAILWAYS FOR YEAR ENDED DEC. 31, 1925

	Eastern District	Southern District	Western District	Total
Number of roads...	172	8	80	260
Miles of roads operated...	8,099	467	5,509	14,074
Investment in road and equipment....	\$806,205,351	\$41,865,505	\$628,717,637	\$1,476,788,493
Freight revenue....	15,214,009	2,538,851	21,249,684	39,002,544
Total operating revenues.....	104,926,687	5,373,939	97,145,412	207,466,038
Total operating expenses.....	84,969,411	4,018,124	79,758,924	168,746,459
Operating income....	28,847,731	1,261,116	18,012,467	48,121,314
Net income.....	5,067,125	(d) 35,569	8,948,648	13,980,204

(d) Deficit.

geles, which reported revenues from freight of \$5,947,157 and from passengers \$12,592,345, making a total operating revenue of \$19,514,325.

Some of the aggregate figures of the Interstate Commerce Commission are given in the accompanying table. The statistics as published give data for each of the 260 companies listed, as well as aggregate figures.

Nashville Celebrates the Arrival of New Cars

Historic Pageant Calls Out Large Crowds—Latest Cars of Modern Type Named After Ten Distinguished Citizens of the State

NEW cars, ten in all, each named after a distinguished citizen of Tennessee, have been added to the rolling stock of the Nashville Railway & Light Company. To celebrate their initial trip, the company held

occasion from "The Hermitage," Jackson's old home near Nashville.

The city press gave a great deal of space to the parade and the lessons taught by it. One of the newspapers described the crowd as "the largest in downtown streets since the citizen troops came home from France." Another, the *Tennessean*, said editorially: "It is a fine thing occasionally to have our attention dramatically and forcefully drawn to the rapid evolution of transportation or something else which plays a vital part in our every-day life. We then appreciate more fully the fact that the blessings, the comforts and the



Nashville Citizens Reviewing the Progress of Urban Transportation from Mule to Motor

a historical pageant on Oct. 29, with a number of earlier types in line, including the first mule car and the first electric car operated in Nashville. The mule car represented the form of transit begun in Nashville in 1866 and the electric car that in 1889. Later types of cars followed in the procession and finally the new cars, gleaming in bright colors.

As passengers the new cars carried as guests of honor 500 representative citizens of Nashville, including the Mayor, other city officials, delegates from civic clubs, historians and editors.

After a trip through the business district and other parts of the city they returned to a central point, where J. P. W. Brown, vice-president of the company, formally presented ten small models of these cars to Mayor Howse as indicative of their dedication to public service.

Special interest was taken in the mule car, and on the following Sunday it was exhibited on the downtown streets of Nashville to a crowd of approximately 5,000 persons.

Among the Tennesseans for whom the new cars are named are three former presidents of the United States, Andrew Jackson, James K. Polk and Andrew Johnson. David Crockett and Samuel Houston are names borne by two other cars. A feature of historic interest in the procession was that the car "Andrew Jackson," which led all of the other new cars, bore a fine gold sword which had been presented to "Old Hickory" in Nashville more than 100 years ago. It had been loaned for the

conveniences which we enjoy today, and we are unquestionably living in the world's best age, are not ours by mere chance. They are ours because men of prophetic vision, of dauntless courage and of intelligently directed enthusiasm have been willing to labor and to risk that we might enjoy them."

Metallic Emblems Identify Inspectors



INSPECTORS of the Union Street Railway, New Bedford, Mass., are now provided with metallic emblems of gold plate and red enamel worn on the coat lapel. The new insignia is quite distinctive and does not tarnish or fray as was the case with the braided monogram formerly used. The new badges of authority met with the heartiest approval of the men.



Tucson Buses Make Profit

**Fare Is 2 Cents Higher than That of Street Cars—
Bus Patronage Has Been Drawn from the Private
Automobile Rather than from the Railway**

OFFICIALS of the Tucson Rapid Transit Company, Tucson, Ariz., are enthusiastic over the outcome of the first year's operation of buses. Revenue and expense figures compiled by the company show a small net profit. During the twelve months the buses have been in operation the street car traffic has shown a slight decrease. The loss on the railway, however, has been much smaller than the total number of the bus passengers carried, indicating that a large part of the present traffic has been drawn from the private automobile.

Operation of buses by this railway was begun in the fall of 1925 with the purchase of an existing route from a private concern. Seldom had more than 100 passen-

time on handbills distributed to the public. Occasionally the company prepares an advertisement and distributes it as an insert with the bills sent out to electric light and gas customers. A typical example of this advertising used is shown in an accompanying illustration.

Bus stops have been marked in an unusual and effective manner. At every corner where the buses stop for passengers a yellow band has been painted around some convenient electric light pole. The width of the band is sufficient to make it easily visible at a considerable distance. On this yellow background the bus schedule has been painted in black, as well as an arrow indicating the direction of the route. Thus a person can come to the corner, look at his watch, then at the schedule painted on the pole and know exactly how long he must wait in order to get his bus. The company has stressed the importance of keeping close to schedule and seldom is a bus more than a minute off schedule.

For the convenience of the bus passengers a vacant



In Tucson Five Buses of 21-Passenger Capacity Operated on Three Routes Supplement the Rail Service of the Tucson Rapid Transit Company

GRAB the BUS

It is cheaper than driving your own car.

It will eliminate the parking nuisance.

It will help remove the traffic congestion.

THE BUS enhances the value of your property, therefore give it your support.

Learn the Schedules

Route No. 1 (North 4th Ave. and E. 6th St.)
Leaves Scott and Congress 15 and 45 minutes past the hour

Route No. 2 (North 6th Ave. and East Speedway)
Leaves Scott and Congress on the hour and half hour

Route No. 3 (Cross Town Bus)
Does not come in to Scott and Congress, but 6th Ave. and Congress - 20-minute service

TUCSON RAPID TRANSIT COMPANY

Typical Advertisement Distributed with Bills to Light and Gas Customers

gers a day been carried on this line. When the company took over the equipment and operation it started an additional line and there was an immediate jump in the number of passengers. Approximately 250 passengers were carried the first day. There are now three lines in operation using four buses in regular service with a fifth in reserve for emergency. On peak days as many as 900 passengers have been carried. Garford and Graham 21-passenger buses are used. Each bus averages 300 miles a day.

BUSES HAVE OBTAINED RIDERS THE STREET CARS DID NOT

In advertising the bus service, the management has been careful to do nothing and say nothing that would detract from the popularity of the street car. Bus operation has been inaugurated to serve the city better without the addition of more trackage and to get business that the street cars were not getting. The principal arguments used for riding the buses have been that they save time and eliminate the difficulty of parking private automobiles. The new service has been advertised in the local newspaper and from time to

building at the intersection of the two busiest downtown streets has been turned into a waiting room. Comfortable chairs are provided. This facility is particularly appreciated in summer, as there is no other shade in the vicinity and the street temperatures are frequently high.

Bus fares are 10 cents as compared with 8 cents on street cars. A passenger may transfer from a bus to a street car without paying additional fare, while to transfer from the car to the bus the passenger pays 2 cents. Bus tickets may be bought in packages of twelve for \$1. These tickets are on sale at a number of downtown drug and grocery stores. Dealers handle the tickets without cost to the company, as they find that this brings additional customers into their stores. To simplify bookkeeping each dealer is advanced one packet of twelve tickets. Additional packets are paid for as drawn. For example, if a new dealer wanted a half dozen packages he would pay the company \$5 and owe \$1. Thus he remains one package to the good as long as he handles the tickets. Making it convenient for the public to buy bus tickets has had an important bearing in encouraging traffic.

Maintenance Notes

Hand-Operated Chain Hoist Made Motor-Operated

HAND-OPERATED chain hoists with traveling crane carriage have been converted into motor-operated hoists in the shop of the Lackawanna & Wyoming Valley Railroad, Scranton, Pa., at a comparatively small expense. This has been



Hoist, Air Compressor, Driving Chain and Motor Control Ropes in Motor-Operated Hoist

accomplished by machining off the rim of the hand chain wheel and installing a suitable gear rim on this surface. An air compressor motor with pinion installed in a cradle rigidly fastened to the carriage drives the hoist by means of a chain belt. A dial switch installed on the carriage and operated from the floor by means of ropes controls the direction of rotation of the motor.

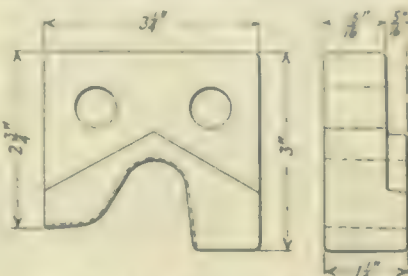
*"Watch your steps."
Keep them in good repair as a safety first measure.*

Tool for Turning Wheel Flanges

SO AS to speed up the work of wheel turning in the shops of the Olean, Bradford & Salamanca Railway, Olean, N. Y., a wheel flange tool was developed to cut the flange and part of the tread in one operation. This consists of a flat piece of tool steel about 3 in. x 2½ in. x 1½ in. at the wide end and 1½ in. at the narrow end. The tool is ground

carefully to give the proper contour to the flange and has sufficient backlash to obtain proper cutting edges and permit of sharpening. The portion of the tool containing the cutting edges is considerably thicker than the rest to allow sufficient stock for sharpening. Suitable holes are provided to allow for solid installation in the tool support.

The wheels to be turned are mounted in the wheel lathe in the usual manner. The tool is fed against the flange, cutting it to size and at the same time removing a portion of the tread to a depth to correspond to the new flange. The



Tool Used by the Olean, Bradford & Salamanca Railway

balance of the tread is turned with a flat tool. This tool has afforded a means for a considerable increase in production with a corresponding reduction in turning expenses.

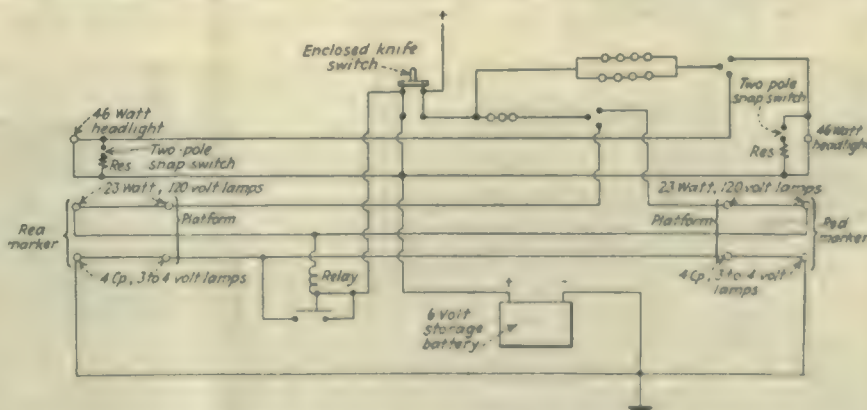
Rear End and Emergency Lighting Prove Economical

STUDY of the problems from all angles resulted in the Harrisburg Railways, Harrisburg, Pa., installing a combination line and battery electric emergency lighting and rear lamp system for the purposes of assuring continuity of service, promoting greater safety and reducing maintenance expenses.

Heretofore oil lamps were used for rear protection. This involved continual daily maintenance expense in collection, distribution and trimming labor. Again, when the power service was interrupted, the car was in total darkness, causing some passengers to become uneasy. To obviate these objectionable features an electrical installation was made

whereby the oil rear lamps were replaced by electric lamps operated from the trolley circuit. In addition a storage battery equipment was installed to permit of lighting the front and rear red dash lamps and platform lamps in case of power interruption.

The equipment consists essentially of two Electric Service Supplies Company's relays and suitable switches, also lamps mounted on either dash, each being equipped with a 120-volt railway type lamp and a 3 to 4-volt lamp and a 6-volt, 100-amp.-hr. Philadelphia Storage Battery Company's battery. All of this apparatus is located conveniently for inspection and maintenance. A



Wiring Diagram Showing Electrical Connections for Headlights, Emergency and Rear Light Installation

4-cp., 3 to 4-volt lamp is installed on either platform and in series with a similar lamp placed in the dash lamps directly behind the 120-volt lamp lighted from the trolley. This series connection permits of an immediate detection of a failure. The storage battery is connected to the end of the car lighting circuit so that it is charged continually, thereby greatly reducing battery maintenance. Transfer of the rear lamps from the 600-volt series circuit to the 6-volt battery circuit is accomplished by means of an automatic relay which completes the battery circuit when the 600-volt source is interrupted.

This arrangement assures rear end protection at all times, whether the 600-volt power is operative or inoperative, thereby greatly reducing the possibility of rear end collision and at the same time minimizing passenger panic due to darkened cars. It also protects both ends of the car with red lights when the 600-volt power is inoperative.

This equipment has cost about \$75 per car to install, but the maintenance saving effected by abolishing the oil lamps has already paid for the installation and permitted of a very substantial profit.

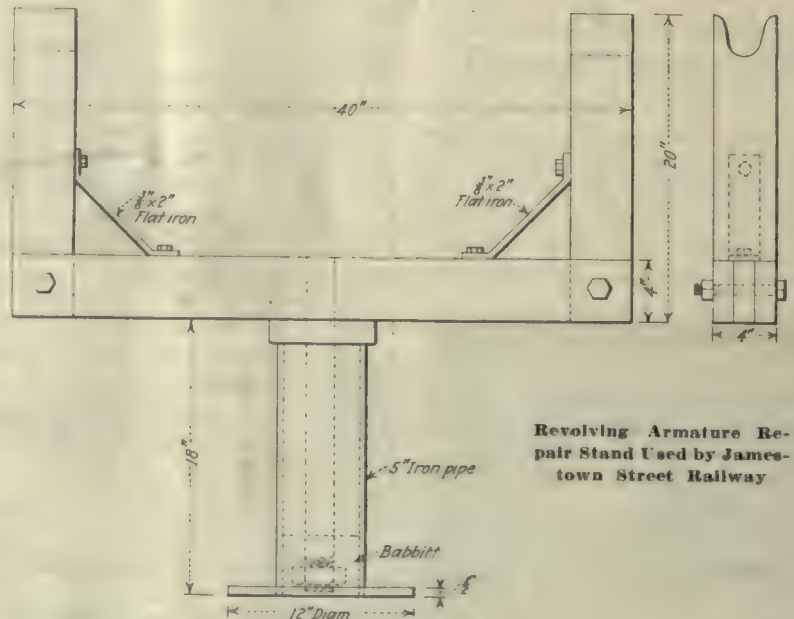
Concrete Ties for City Trackwork

REINFORCED concrete ties may be used successfully in street track construction in the opinion of engineers of the Los Angeles Railway. This opinion is somewhat substantiated by the condition of a large number of such ties which have been recently removed from South Broadway between First and Twelfth Streets, a heavy traffic section, after fifteen years of service. The cause of removal was the failure of the rail fastening. In this case a square spike had been driven in a piece of

pipe imbedded in the concrete. Corrosion loosened the hold of the spike in the pipe and this, combined with corrosion of the tie plate, also cast in the tie, caused the rails to loosen.

With these difficulties eliminated, which is planned in future ties of this construction, it is believed that a tie will be obtained which will have indefinite life.

Revolving Armature Repair Stand



PROVISION has been made for the maximum of daylight on the part of an armature undergoing repairs in the shop of the Jamestown Street Railway, Jamestown, N. Y., by the design and construction of a revolving armature repair stand.

The armature room is surrounded on three sides by a brick wall, so that the daylight working conditions are not of the best. With a non-revolving type of armature repair stand, it was necessary to perform the greater portion of the work by means of artificial light, which in a great many instances was found to be very unsatisfactory. The revolving stand consists essentially of two independent parts, a pedestal and an armature cradle. The pedestal is made of a 5-in. iron pipe about 18 in.

long, fastened to a $\frac{1}{2}$ -in. steel plate of 12 in. diameter. A 1-in. round rod is passed through the center of this pipe and the bottom fitted with a nut and all securely babbitted in the base of the pipe. The upper part of the rod, held in position by passing through a drilled cap screwed onto the top of the pipe, projects about $4\frac{1}{2}$ in. above.

The cradle is made of 4-in. x 4-in. oak timbers about 20 in. high and 40 in. long. The uprights are recessed to act as bearings for the armature. They are braced to the horizontal section by means of $\frac{3}{8}$ -in. x 2-in. flat bar. A $1\frac{1}{8}$ -in. hole bored in the center of the bottom beam of the cradle slips over the 1-in. iron rod projection on the pedestal. This permits of free movement.



Reinforced Concrete Ties Removed After Fifteen Years Service by the Los Angeles Railway Because of Failure of Rail Fastening. Experiments Are Being Conducted with Similarly Constructed Ties with Difficulties of the Early Tie Eliminated

This stand allows the turning of the armature to any angle desired to obtain the maximum of daylight. It can be dismantled readily or stored away when desired.

New Equipment Available

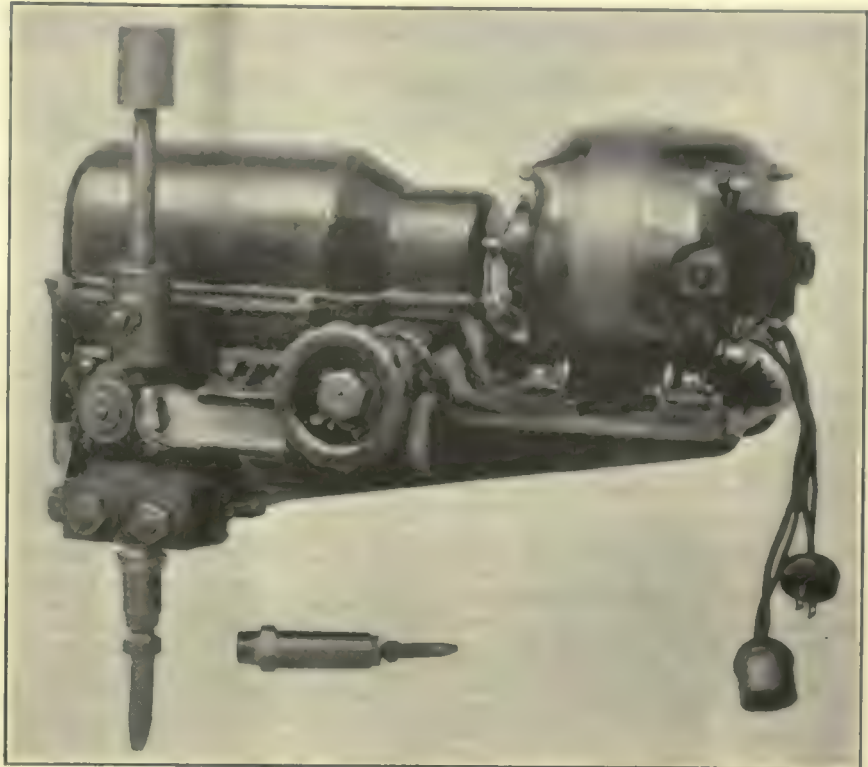
Automatic Welder Speeds Accurate Work

WELDS can be made with great smoothness, speed and accuracy, it is stated, through the use of an automatic welder introduced by the General Electric Company, Schenectady, N. Y. With this equipment, the operator needs but to push a button to start, without any further effort or skill on his part, the sequence of operations which produces the weld.

The new welder starts the arc first by touching the electrode to the work and then withdrawing it. Thereafter a constant arc length is maintained by feeding the electrode wire to the weld at the exact rate of speed necessary to replace the metal fused into the weld. It is claimed that the new equipment will perform these operations more rapidly and with a greater degree of accuracy than is possible by the most expert hand operators.

The automatic welding head incorporates the necessary mechanism for feeding the electrode to the arc and consists essentially of a pair of feed rollers geared to a constant speed motor through a magnetic clutch. The gearing and feed mechanism are contained in one housing to which the motor is bolted.

The rollers feed the welding wire through the nozzle to the arc. The distance and pressure between these rollers is adjustable. Each welding head is equipped with a set of nozzles for $\frac{1}{8}$ -in., $\frac{1}{4}$ -in., $\frac{3}{8}$ -in., $\frac{1}{2}$ -in. and $\frac{3}{4}$ -in. wire. The speed of wire feed may be adjusted by means of a selective gear changer which adapts the speed of the feed rollers to the size of wire and welding current used. Three gear speed changes can be made. An additional finer adjustment can be made by means of a rheostat in the field of the motor. Provision is made for pointing the electrode backward or forward in the line of weld by rotating the head on its horizontal shaft and for moving it side-



Typical Automatic Arc Welding Head

ways by means of the handwheel on the front of the head.

The control equipment consists of a control panel, a meter panel and a push-button station. The control panel mounts the main line contactor for the welding circuit and two smaller contactors for interlocking the travel motor with the arc. By means of auxiliary contacts, the line contactor controls the starting and stopping of the feed motor. The magnetic clutch is operated forward or backward by a voltage relay, the coil of which is connected across the arc. Thus the electrode is fed to or from the work automatically, adjusting itself to any irregularities in the surface of the work. One rheostat controls the speed of the feed motor and the other controls the voltage setting of the arc.

The automatic arc welder will be sold either separately (where the user constructs his own clamps) or as part of a complete welding equipment, including the necessary clamps and framework for holding the work.

Improvements in Wood-Working Machine

SEVERAL interesting improvements have been incorporated in the 20th Century Wood Worker as manufactured by the Cresson-Morris Company, Philadelphia, Pa. A tilting head has been added which makes

it possible to cut at a double angle. The rip saw works through an improved cast-iron table, which also serves as an operating table in cross-cutting. The tilting cast-iron fence guide can be adjusted to any angle, thus making possible accurate work.

A new boring attachment and operating table are now standard equipment with this machine. High-



The New Tilting Head Makes a Double-Angle Cut Possible

speed boring and drilling can be done by using the large belt with which the machine is provided. A special V-shaped belt is also furnished for use in boring when reduced speed is needed.

American Association News

Service Betterment

SUBJECTS to be considered during the ensuing year were discussed at a meeting of the committee on service betterment, held at association headquarters, New York City, on Dec. 16. The general topics which will be studied include traffic control, speeding up service, employee courtesy, frequency of service, car design, and acceleration and braking. Members present were C. D. Smith, F. J. Denny, W. J. Flickenger, E. A. Palmer, J. C. Thirlwall and S. E. Emmons, chairman.

New Publication Policy on 1926 Proceedings and Manual

PROCEEDINGS of the American and affiliated associations for 1926 will be available for distribution to member companies early in 1927. The officers of the association have adopted a new policy—that copies of the Annual Proceedings will be sent only to members requesting them. Each company and associate member is entitled to a complete set of the Annual Proceedings and a reasonable number of extra copies without charge. Individual members are entitled to one copy of the Proceedings of the association with which they are affiliated.

The 1926 edition of the Engineering Manual will also be available shortly after the Annual Proceedings are off the press. This will be the second bound edition of the Manual, which is now published every third year, and it will contain all of the revisions and additions made in 1924, 1925 and 1926. The first edition of the Manual contained 1,030 pages. Since that time there have been 700 pages of additional specifications and revisions.

Executive Secretary J. W. Welsh is addressing all members, requesting them to inform him before Jan. 1, 1927, regarding the number of volumes of the Proceedings and of the Engineering Manual which they will require in order to determine the number to be printed.

Purchases and Stores Committee Outlines Work for the Year

SO FAR REACHING is the subject of properly disposing of unused, inactive material that President Durie of the American Electric Railway Engineering Association formally authorized the committee on purchases and stores to co-operate with the purchasing and storeroom accounting committee of the National Electric Light Association in studying the various problems involved. On Dec. 6 the committee on purchases and stores invited members of the N.E.L.A. group to join with it in a meeting at association headquarters in New York City.

Discussion of the subject of particular interest to both groups divulged

the facts that the establishment of a bureau to handle the unused materials would involve a rather large expense and that it would have to do a business of \$250,000 a year to justify its existence; further, it would meet with considerable opposition from independent dealers in the field. It was also developed that if the plan were to be put into operation on a larger and broader scale, the assessments to member companies would be excessive.

A sub-committee of the committee on purchases and stores was appointed to continue the study of and make recommendations regarding the disposal of this type of material.

Other subjects considered at this meeting, in formulating the program for next year, were the review of existing Purchases and Stores sections of the manual for revisions and corrections; the need for a further study of routine methods to be followed in purchasing and stores departments and the study of a uniform method of distributing materials by supply trains and trucks; a uniform system for inspecting and testing materials, with a view to recommending what classes of materials are to be inspected and tested at the factories and what classes at the point of receipt. Sub-committees were appointed to handle these various phases of the year's work.

The meeting was attended by the following committee members: J. Fleming, chairman, presiding; J. Y. Bayliss, A. C. Duncan, A. L. Fischer, B. W. Forkner, A. E. Hatton, W. E. Scott, W. J. Walker.

Representing the purchasing and storeroom accounting committee of the N.E.L.A. were: E. S. Brock, chairman; D. A. Truax, E. M. Burbank, G. W. Young, C. A. Harris, K. C. Campbell, A. Ziegler, Lewis A. Jones, W. F. Stevens.

Special Bulletins Available

FOLLOWING is a list of special reports prepared by the Bureau of Information and Service of the American Electric Railway Association. They are available to member companies upon request:

Bulletin No. 115. Wages of Employees Other Than Trainmen.—This gives for about 230 companies a classification of employees and the wages paid each class in the shop, carhouse, way and structures, car, overhead line, stores and bus maintenance and garage departments. It also gives the number of hours worked weekly, the average weekly wages earned, overtime rates and number of employees in each department.

Bulletin No. 116. Effect of Fare Changes on Revenues and Riding Habit.—A group of companies having had two or more fare changes has been selected and a detailed record of their revenue passengers and passenger revenues month by month before and after the date of the fare change, has been compiled. The average daily number of passengers carried and the average daily passenger revenue under each rate of fare is compared, and there is also shown a comparison of the percentage of revenue passengers using transfers and reduced rate tickets under each rate of fare.

Bulletin No. 117. Analysis of Electric

COMING MEETINGS OF

Electric Railway and Allied Associations

Jan. 6-7—Midwest Electric Railway Association, midwinter meeting, Mayo Hotel, Tulsa, Okla.

Jan. 7—American Electric Railway Association, Metropolitan Section, Engineering Societies Building, New York City, 8 p.m.

Jan. 10-14—American Road Builders' Association, convention and road show, Coliseum, Chicago, Ill.

Feb. 18-19—Kentucky Association of Public Utilities, annual convention, Brown Hotel, Louisville, Ky.

Jan. 19-20—Central Electric Traffic Association, Fort Wayne, Ind.

Jan. 21-22—Central Electric Railway Accountants' Association, Fort Wayne, Ind.

Jan. 25—New York Electric Railway Association, winter meeting, Hotel Commodore, New York City.

Jan. 26-28—Association of Equipment Men—Southern Properties—Memphis, Tenn.

Feb. 3-4—Central Electric Railway Association, winter meeting, Toledo, O., Commodore Perry Hotel.

Feb. 7-10—American Institute of Electrical Engineers, annual convention, Engineering Societies Building, New York City.

Feb. 10—Central Electric Railway Master Mechanics' Association, Toledo, Ohio.

Oct. 3-7, 1927—American Electric Railway Association, annual convention, Public Auditorium, Cleveland, Ohio.

Railway Franchises, Part II.—This is an identical analysis of twelve recently granted franchises under the following main subjects: General Terms, Public Control, Fares, Regulation of Service, Finances, Capitalization and Accounts, Regulations Governing Company's Use of Streets. Part II covers the last four subjects mentioned.

In addition to the above the following supplements have been prepared, bringing the information they cover down to December 1, 1926:

Supplement No. 15 to City and Interurban Fare Bulletins Nos. 41 and 42.
Supplement No. 2 to Bulletin No. 108, Wages of Trainmen.
Supplement No. 2 to Bulletin No. 109, Wages of Busmen.
Cost of Living Studies (Bulletin No. 118).

Kentucky Meeting Postponed

DUE to a conflict of dates the Kentucky Association of Public Utilities will hold its annual meeting Feb. 18 and 19 instead of in January as previously scheduled. Headquarters will be at the Brown Hotel, where the first session will convene on the afternoon of the 18th at 2 p.m.; following the meeting on this day, will be held a banquet and dance. The second session will open at 9 o'clock the following morning.

W. H. Sawyer, president of the American Electric Railway Association, will be one of the principal speakers.

The News of the Industry

Dayton One-Man Car Ordinance Unconstitutional

In an opinion handed down recently the United States Circuit Court of Appeals affirmed the decision of Federal Judge Hickenlooper that the city ordinance of Dayton, Ohio, prohibiting the operation of one-man street cars was unconstitutional. The city of Dayton had appealed from this decree, which enjoined the enforcement of the ordinance. On Dec. 14, 1921, the City Council of Dayton passed an ordinance authorizing the installation of the one-man type of car. Later, in 1923, agitation was promoted by representatives of organized labor for the repeal of the ordinance. On Nov. 6, 1923, the first ordinance was repealed and the new law was passed providing a fine of \$35 a day for each car manned by a motor-man alone. Appeal was taken from this on the ground that it was unconstitutional and a violation of the Fourteenth Amendment in taking away property without due process of law.

Open House a Success in Wisconsin

More than 90,000 persons were shown through 62 public utility plants and offices in 27 cities during the open house show conducted recently by public service companies in Wisconsin, according to a report made by John N. Cadby, executive secretary of the Wisconsin Utilities Association. Mr. Cadby said that since this was the first attempt to hold a state-wide open house exhibition in Wisconsin the public response was highly gratifying. Approximately 4,500 in. of newspaper advertising space was used in the daily and weekly newspapers by the different companies to acquaint the people with the attractions offered in the open house show. By far the largest share of this advertising was prepared by the Wisconsin Public Utility Information Bureau. Most of the success of the exhibition is attributed to this concentrated advertising program. The conduct of the Milwaukee open house show is described elsewhere in this issue.

Mitten Management Makes Good Bank's Losses

Mitten Management, Philadelphia, Pa., has been enabled to fulfill its promise to restore to depositors of the defunct Producers' & Consumers' Bank the full amount of their original deposits. This fact is disclosed in a statement announcing that \$175,612 is now credited to the individual accounts of 1,168 depositors of the former Producers' & Consumers' Bank, who ac-

cepted the Mitten reorganization plan for straightening out the financial affairs of the bank. The losses of the Producers' & Consumers' depositors, the statement pointed out, have been made up, not out of the profits of the new Mitten bank, but by direct contribution of \$175,612 from Mitten Management funds.

The statement made two other interesting announcements. One was that

the Christmas issue of *Service Talk* would have something to say regarding the prospects of repayment to the Producers' & Consumers' stockholders "who went along with Mitten in the Mitten Men & Management Bank." The other was that the Mitten Men & Management Bank & Trust Company, which succeeded the Producers' & Consumers' Bank, will move into its new bank building on Jan. 1, 1927.

Changes in New York Regulatory Plan

New Public Service Department Is Created to Be Headed by Chairman of Present Public Service Commission—Will Take Over Public Service and Transit Commissions

NOBODY at Albany seems to know exactly what effect the reorganization of the state government into eighteen departments or groups will have upon the administration of the two bodies now functioning under the provisions of the public service commission law.

On Jan. 1, 1927, a complete change in the administrative structure of the government of New York State will go into effect under the provisions of what is known as the new "state departments law," passed by the Legislature of 1926. Originally advocated by the Constitutional Convention of 1915, this reform was successfully brought about as a part of the program of Governor Smith to increase efficiency in the operation of government. Under the provisions of such law, the Governor will have control over sixteen out of the eighteen groups of governmental machinery.

The experts who drafted the structural law to effectuate the reorganization scheme claim that after Jan. 1 the Public Service Commission and the Transit Commission will continue to function exactly as they have done in the past so far as the regulation of the affairs of public utilities is concerned, and that the only change will be in the physical description of the two bodies. A serious question arises as to whether, in an attempt to consolidate two quasi-judicial bodies under one head and at the same time preserve their individual entity, the effectiveness with which either or both bodies may function may not be impaired.

The new law, which is included in Article 16 of the state departments law, says:

There shall be in the state government a department of public service. The chairman of the public service commission shall be the head of such department and when acting in such capacity shall be known as the chairman of the department of public service. . . . There shall be in the department of public service a division to be known as the state division and a division to be known as the metropolitan division.

The new law then provides that

The head of the state division shall be a public service commission, to consist of five

commissioners, who shall be appointed by the Governor, etc. A commissioner to be designated as chairman in his appointment as such commissioner shall be chairman of the commission until his term as commissioner expires.

The head of the metropolitan division shall be a transit commission, to consist of three commissioners, who shall be appointed by the Governor, by and with the advice and consent of the Senate, for terms of nine years each. A commissioner designated by the Governor shall, during his term of office, be the chairman of the commission.

It is provided in the law that

The state division, by the public service commission and commissioners, shall have, exercise and perform the jurisdiction, supervision, functions, powers and duties of the public service commission and commissioners, as prescribed by law when this article takes effect.

The metropolitan division, by the transit commission and commissioners, shall have, exercise and perform the jurisdiction, supervision, functions, powers and duties of the transit commission and commissioners, as provided by law when this article takes effect.

This much of the new law is entirely plain. The next section, however, states:

The head of the department (Department of Public Service) shall be the chief executive officer thereof (chairman of the Public Service Commission). The appointment or removal of all officers, clerks, inspectors, experts and employees of the department or of any division thereof, and all contracts for special service, shall be subject to his approval. The organization of the existing office of the public service commission is continued as the organization of the state division, and the organization of the existing office of the transit commission is continued as the organization of the metropolitan division, except as provided by this article or otherwise by law.

Read literally, this apparently means that the chairman of the Department of Public Service, who is the head of the state division in relation to the regulation of utility corporations, will have the power to hire, discharge, fix the compensation of the employees and must approve all of the payrolls and other vouchers calling for the expenditure of money of both the state division and the metropolitan division.

He has nothing to say about the personnel of the membership of the metropolitan division, neither does he have any voice in their acts in relation to the regulation of utility corporations.

The metropolitan division; that is,

the Transit Commission, is supported, in so far as the payment of its employees is concerned, by funds appropriated by the city of New York, so that under the provisions of the new law, if its literal conception be correct, the head of the state division, also the head of the two divisions combined, will be approving the payment of moneys out of funds belonging to the city of New York, as well as the salaries of the commissioners of the metropolitan division, an extremely weird legal situation.

MORE MOVES CONTEMPLATED

Governor Smith in a letter addressed to Hon. Walter W. Westall, chairman of the State Reorganization Commission, pointed out on Dec. 20 certain apparent defects in the reorganization plan which becomes effective Jan. 1, and has proposed certain legislative changes. In reference to the Public Service Commission and the Transit Commission, the Governor has this to say:

In my detailed recommendations you will note that I recommend that these two commissions be combined as contemplated by the constitution and that the head of the department be a single public service commission. If this is not done and the anomalous arrangement in the present state departments law remains, then the functions of the two divisions of the department which are semi-judicial in nature and their decisions in such matters should not be subject to the approval of the chairman of the department.

I believe that the structure for the department of public service set up by the state departments law is unconstitutional, unwise and wholly contrary to sound, administrative practice. Under the present

law the department consists of two practically independent divisions, but in order to have a nominal head of the department so as to conform to the letter of the constitution, it is provided that the chairman of one of the divisions shall for purposes of controlling appointments and salaries be the head of the department. This is no real department head and the arrangement can only lead to friction and trouble within a department whose real functions are regulative and judicial. There should be one Public Service Commission at the head of the Department of Public Service and this Public Service Commission should have charge of all of the functions given to the state division and to the metropolitan division in the present law. The chairman of the Public Service Commission should carry out the administrative policies determined by the commission.

By reason of an imminent vacancy in the Public Service Commission the time is now opportune for the consolidation of the so-called metropolitan division and the state division into one commission consisting of seven members, leaving the present incumbents and existing terms just as they are, and providing that the state division chairman shall be the chairman of the commission. I therefore recommend to you that you consolidate the two divisions, abolish the position which is about to become vacant and that you leave the internal organization of the department to be worked out by the commission.

With reference to the public service and public works departments, I strongly recommend that you define more clearly and logically the relative functions of these departments as to grade crossing eliminations. I believe that outside of New York City these eliminations should be initiated and all engineering plans and supervision not entrusted to the railroads should be in charge of the Public Works Department. The Public Service Commission, on the other hand should order all eliminations. The present situation is confusing. There is bound to be duplication of work, and the responsibility is scattered and lost.

The reorganization commission is at work redrafting present statutes to conform with the reorganized scheme of government.

and is meeting some opposition in the Council. Councilman W. T. Campbell suggested the plan, pointing out that the city could issue as much as \$1,500,000 in bonds, which would put the railways over the peak, he declares.

The City Council of Seattle has accepted the proffered services of the Westinghouse Electric & Manufacturing Company to have one of its engineers conduct a survey of the municipal railway.

D. W. Henderson, general superintendent of the railway, recently issued a statement in which he said:

There has been so much misrepresentation and distortion of the facts concerning our street railway system and in particular concerning the purchase of the new cars, that I believe the public is entitled to an unbiased statement of the facts.

TRYING TO PAY DEBT IN 20 YEARS

We are attempting to pay the entire cost of our system out of its income in twenty years, something which no privately-owned road has ever been able to do. In addition we are paying 5 per cent interest on the amount outstanding, and are charged with 4.2 per cent depreciation. In the last six years we have spent \$1,736,744 for converting two-man cars into one-man cars and for new trackwork, both of which items are really capital investments. The sum total of these charges amounts to 16.2 per cent on the original investment, which no privately owned line could or would be permitted to earn.

No accurate or impartial statement has been presented to the public concerning the savings to be effected by the purchase of the new cars. Everyone, from the Mayor down, who has taken the trouble to consider the facts and figures, has become thoroughly convinced of the reality of the savings that can be realized by the purchase of the new equipment. If the people of the city will analyze these figures with the same impartiality that they employ in their own affairs, I am certain that they also will be convinced.

It is significant that modernization of equipment has, in absolutely every case throughout the United States, been the solution of the railway problem, and has invariably resulted in putting street railway properties on a paying basis.

Statistics have been gathered by the American Electric Railway Association, comparing twenty representative roads throughout the country which have modernized their equipment with twenty very similar roads which have not done so. The roads involved range all the way from those of large cities like Boston and Pittsburgh down through those of cities of the same class as Seattle, such as Providence and Houston, to the smaller lines in cities of only a few thousand population. They include strictly metropolitan systems, suburban and interurban systems and combinations of the two. The figures, therefore, represent a fair cross-section of the American street railway industry as a whole.

QUOTES "JOURNAL" AS HIS AUTHORITY

The detailed statistics can be found in the Sept. 25, 1926, issue of the ELECTRIC RAILWAY JOURNAL, page 495, which is the technical trade paper of the American electric railway industry. The comparison shows an average saving of 9.65 cents a car-mile. The 80 new cars will be run an average of 130 miles a day for an average of 350 days a year, or a total of 3,640,000 car-miles. If we apply this figure of 9.65 cents a car-mile the gross saving to be expected is \$351,260.

I have made a detailed analysis of actual Seattle operating conditions. This shows that due to the very heavy and old equipment which we are now using, and the satisfactory rate of wages paid to our men, a much larger saving is to be foreseen. The yearly totals are as follows:

Mechanical department	\$114,840
Track maintenance	28,815
One-man operation	261,632
Total	\$405,287

The interest charge on the new equipment will be 6 per cent and the depreciation rate fixed by the state 4.2 per cent. The total purchase price of the new cars is \$1,420,000, so that deducting 10.2 per cent of this sum, or \$144,840, from the gross saving, there remains a net saving of \$260,447.

Seattle Decides to Borrow

**City Will Take \$135,000 from Light Department to Tide Railway Over—
Superintendent Henderson Asks for Public Co-operation—
Explains Savings by Purchase of 80 New Cars**

AN ORDINANCE providing for a loan of \$135,000 from the light department to the municipal railway department, at Seattle, Wash., a measure designed to tide the railway over its present financial difficulty, has been passed by the Council and signed by Mayor Bertha K. Landes. The measure becomes effective within 30 days, but it faces the prospect of a test suit in court by a committee of fourteen taxpayers, headed by S. B. Asia, who have at all times protested the invasion of the general fund and who have criticized the Council's policy of borrowing money from one fund for the aid of another. They declare there is no statute authorizing the Council to make these loans.

E. L. Blaine, chairman of the finance committee, declares the city has saved about \$30,000 a year by using the idle fund of one utility to assist another utility. He points out that the fact that the city is barred by law from loaning the proceeds of bonds voted by the people does not prohibit it from loaning from one utility to another. He points out that by making use of an idle utility fund it becomes unnecessary to borrow money at 5 or 6 per cent.

In the meantime, Mayor Bertha K. Landes has submitted to the Stone & Webster officials in Seattle a request

for a revision of the municipal railway purchase contract that would extend the time on the purchase bonds and thus reduce the annual payments on the contract. The proposal was laid before A. W. Leonard president of the Puget Sound Power & Light Company, and Judge James B. Howe, Western attorney for the Stone & Webster interests. Mr. Leonard advised Mayor Landes that he would recommend an extension of time on the bonds, provided it could be done without affecting the priority of the claim of the bonds.

In this connection, Mayor Landes said that "there has never been as much reason for optimism as there is today" in railway affairs. She declares that this optimism should exist because of the reduction in operating expenses which will be effective on Jan. 1, with an estimated saving of \$300,000 a year. With this in view, she deprecated any action on the part of citizens to involve the railway in litigation and urged the co-operation of all taxpayers in furthering the affairs of the lines.

Another possible solution of the railway problem under consideration in the City Council is a plan to ask the taxpayers, if necessary, to pass a general fund bond issue which would place the railway on its feet. The plan thus far is in only the most tentative state

It has been stated that the rerouting plan will eliminate 60 cars and that consequently there will be no use for the 80 new cars. The rerouting plan probably will not save this number of cars, but even assuming that it will, it is nevertheless true that we now are operating 170 old type two-man cars, and it would be economy to place all these old cars in reserve for rush-hour operation and purchase this number of new light-weight cars.

STORAGE AND TRACKAGE AMPLE

No outlay whatever for additional storage tracks or shelter will be required, as the existing carhouses and storage tracks are sufficient to take care of eighty additional cars.

What our street car system needs more than any other one thing is the loyal co-operation and good will of the business men and citizens of the city. Our street car system is vitally important to the welfare of the city and deserves the support of all of our public-spirited citizens. It is certain that obstructionists and pessimists cannot help us. They can only hamper the efforts of those who are trying to do something for the transportation system of the city.

Indiana Commission Under Fire

Foes of the Indiana Public Service Commission are preparing for the coming session of the Legislature, which convenes in January. A bill already is being drafted which will abolish the commission, if it is passed. Samuel Lewis Shank, twice Mayor of Indianapolis and probably the most popular politician in the city, has come out flatfootedly against the commission. He is making addresses at every opportunity urging the people to compel their legislators to pass a bill such as has been suggested.

Fairmont Company Explains How Employee Loans Are Floated

The rules under which the Monongahela West Penn Public Service Company, Fairmont, W. Va., is prepared to make loans to its employees were explained in a recent issue of *Courtesy and Service*, the official publication of the company. Owing to the fact that a mistaken idea was circulated that the company loaned money for various purposes, and because many employees have asked for details, the company, through a resolution of the board of directors, has made it plain that loans can be made only in case of sickness or death in the family of an employee or in other extreme emergencies. The plan of the company is to authorize loans with an aggregate limit of \$5,000, with the understanding that no loans shall be in excess of 20 per cent of the yearly salary of the employee.

Loans are to be repaid in monthly installments within a period of one year, with interest of 6 per cent per annum on the unpaid balance. An employee must make written application to the head of his department, supplying proof that the funds are needed for purposes allowable by the company. When the head of the department is satisfied that the request is bona fide he forwards it to the department of public relations, and it goes thence to the treasury department. In case of request for a loan for an emergency other than sickness or death a written request goes first to the head of the department and thence to a committee of three officials, who make recommendations to the president of the company, who passes on it finally.

Kiwanians Reminded of the Value of their Railway

Certain promoters of the public welfare in Scranton, Pa., believe that if trolleys instead of automobiles were used by business men the parking problem in the city would be greatly alleviated. One of these is Otto Conrad of the Conrad Motor Car Company. He has presented to the Kiwanis Club of Scranton 150 trolley tokens and has suggested that business men in Kiwanis start the movement for using the trolleys. He further suggested that Kiwanians might view their city some evening by taking a trolley ride. To the latter suggestion Jilson J. Coleman, vice-president and general manager of the Scranton Railway, replied that he would be glad to provide a special car for the purpose.

In his letter to the president of the Kiwanis Club Mr. Conrad takes occasion to praise the work of Mr. Coleman, who recently purchased new cars "just in order that more people could ride."

Beaumont Motormen Win Accident Pennant

Keen interest was aroused in a contest held by the motormen of the Northern Texas Traction Company, Fort Worth, and other properties recently in an effort to cut down the number of accidents. The city was divided up into eight sections, each section representing a team in the "Texas" League. The plan, then, was to see which team could have the highest percentage for a given length of time. A pennant was the prize.

The team representing "Beaumont" completed the season without any black marks against it. This aggregation,

No Wonder It Ran!

Ever since prohibition the Cincinnati, Lawrenceburg & Aurora traction line has been a daily violator of the prohibition laws—and it didn't know it until yesterday.

A bottle of liquor, good, old-fashioned liquor that makes the mouth water, tumbled out of a compartment under a window of a car that workmen were remodeling. The bottle could have been put there only when the car was built—and it had been in service on that line for 26 years.

For 26 years, then, it was said, the liquor had been reposing in the window compartment, securely sealed from discovery. There's no telling how many passengers had it within elbow reach, so to speak.

Robert Lyons, North Bend, a traction conductor, who traveled around the world with the navy years ago, and who modestly admits he's had experience with the taste of liquor in various parts of the world, sampled the contents just before starting home.

"Boy, it's there," he said. That's all there was. There wasn't any more.—*Cincinnati Enquirer*.

representing about 25 motormen, has been officially crowned champion. "Fort Worth" was a close second. In many cases the mere bumping of an auto fender would cost a "game," so extreme care was taken in all operations.

"L" Improvement Work in Chicago Progressing

Work on the platform extensions on the Douglas Park, Logan Square and Humboldt divisions of the west side lines of the Chicago Rapid Transit Company is about 80 per cent completed. Eight-car trains are now being operated in the rush hours on all the other lines and longer trains will be run on the three branches named as soon as the platforms are ready to accommodate them.

Work is now proceeding on the moving of columns on Wabash Avenue at cross street intersections. Thirteen of these supporting columns have to be moved to the edge of the curb, in accordance with an agreement with the city. Four foundations at Jackson, four at Monroe, and three at Washington Street are already completed. Two at Van Buren and Wabash are nearly complete. It is expected that the steel work will be in place around Jan. 1. The cost of this work on Wabash Avenue will be about \$125,000. It was necessary to sink the foundations to hard pan, 63 ft. below the sidewalk level.

Casualties Fewer in Westchester

Westchester County, N. Y., reports fifteen dead and 155 injured in automobile accidents during October, 1926, as against sixteen and 180 for a similar month the year previous. Barron Collier, chairman of the Public Safety Bureau, believes the decrease reflects the results of the safety campaign being waged there. He scores, however, the record of one person killed every two days and five seriously injured each day, and suggests that people drive as they would before the accusatory appearance of a policeman so that many lives might be spared and much suffering and misery avoided.

Reference to "Aunt J. Walker" and the safety campaign in Westchester was made in the *ELECTRIC RAILWAY JOURNAL*, issue of Nov. 27, page 983.

John A. Beeler to Appraise Louisville Property

The appointment of the Beeler Organization, New York City, as appraisers of the properties of the Louisville Railway, Louisville, Ky., was announced recently by Mayor Arthur A. Will. The appointment is subject to the approval of the General Council.

The appointment was mandatory under the new ordinance passed last August for the Louisville Railway. That measure specifies that the property in use and useful for public service will be the basis for the rate of fare. Under the contract with the organization, work will commence within thirty days and will be completed within six months. The railway will pay the costs of the appraisal.

Five-Cent Fare Zones in Tacoma

According to an agreement between the City Council and the Tacoma Railway & Power Company, Tacoma, Wash., the railway lines on Dec. 20 were to begin operation on the zone basis, with a central 5-cent fare zone. Tokens will remain at the same price as now and will be good for a ride either in the outside zone or through both zones, with universal transfer privileges. For token riders the new system will mean no change except that the pay-as-you-leave system of fare collection will apply to all lines on outbound trips, whereas it was in effect only on the Sixth Avenue and Point Defiance lines.

The idea back of the zone system is to increase the amount of short, downtown and close-in district riding by establishing a cheap fare. Cash fares in the outside zone or for riding through both zones, with universal transfer privileges, will be 10 cents under the new plan; this is an increase of 2 cents. The increase will affect only 10 per cent of the riders living in the outside zone, it is reported by the Tacoma company. Mayor M. G. Tennent pointed out the publicity value of the system, in that any stranger riding from a depot to uptown points would pay only 5 cents, and thereafter think of Tacoma as a 5-cent fare city. The 5-cent fare will carry no transfer privilege and the zone system will cover a period of 60 days.

The six months trial period under which the company has been operating expires Jan. 1, but under the new agreement will be extended to cover the zone test. Under the test agreement the company had the right to demand higher fares for the past three months, but has withheld such demand in the interests of a friendly settlement. Manager Richard T. Sullivan of the company estimates that a gain of \$68,184 might be expected under the zone system, but it is pointed out that this falls far short of the yearly deficit of \$195,000 which the company claims it would suffer during 1917 if the present fares were maintained.

Wages Advanced in Baltimore

The United Railways & Electric Company, Baltimore, Md., has granted an increase in pay of 1 cent an hour to all motormen, conductors, shop employees and the members of the force of the engineering department and to train dispatchers. The change will become effective on Jan. 1. In addition to this 1-cent increase, the company also has agreed to another increase of 1 cent during 1928.

The agreement was in the nature of a compromise. The United Railways Association asked for an increase of 3 cents an hour, to take effect on Jan. 1. Representatives of the association and of the company were in conference for several hours before the plan of increase agreed upon was worked out. Members of the association were shown by the United officials that an increase of 3 cents could not be granted without an increase in fare.

President Emmons said that it was the company's aim to continue the

present 7½-cent fare, but with operating costs increasing constantly on account of traffic congestion it became more and more difficult to do this and give good service.

Following the agreement, Mr. Smith, the president of the association of employees, and George Wolf, chairman of the wage committee, issued a statement as follows:

The men of the United Railways whom we represent want an increase in wages of 3 cents an hour, but we realize that in the company's present earning condition no such increase in wages is possible unless there is an increase in fares.

We do not desire to subject Baltimore car riders to an increase in fares at this time, since we feel that Baltimore's favorable position as a city of low living cost and hence as a desirable city for the growth of industry and business is largely due to its reasonable rate of fare.

The change will make the minimum wage 49 cents and the maximum wage 54 cents in 1928, with 59 cents for one-man car operators.

The increase will add about \$150,000 to the payroll during 1927 and double that amount in 1928.

Buffalo Employees Get Pay Boost

Thomas E. Mitten, president of Mitten Management, announced at a recent meeting of the International Railway Co-operative Association that the basic wage rate of employees of the International Railway, Buffalo, N. Y., would be increased for the year 1927 by 2½ cents an hour. This increase is in recognition of the splendid co-operation of the employees through whose efforts accidents have been reduced 15 per cent in the last two years.

St. Louis Franchise Negotiations to Be Resumed

Resumption of the negotiations between officials of the St. Louis Public Service Company, St. Louis, Mo., and the city authorities relative to a new blanket franchise for the United Railways probably will be resumed during January. In the meantime it is expected the Missouri Public Service Commission will pass on the application of Receiver Rolla Wells for an increase in fares. The Public Service Company seeks to be permitted to earn 7 per cent under a service-at-cost franchise. In the face of the recent United States Supreme Court decision Mayor Miller has not retreated from his position favoring a 6 per cent return. He says he will explain his views to the public.

Survey in San Francisco Started

San Francisco, Cal., city officials have started a survey with the end in view of acquiring the Market Street Railway and consolidating it with the Municipal Railway system. The Board of Supervisors' resolution calling for the survey was referred to in the *ELECTRIC RAILWAY JOURNAL*, issue of Dec. 18, page 1108. Mayor James Rolph, Jr., and City Engineer M. M. O'Shaughnessy were excluded from membership on the joint committee. The first of the Market Street Railway franchises, mentioned in the resolution, will expire in 1929.

Committee Reports on Rochester's Subway Railroad

That the city-owned subway in the bed of the abandoned Erie Canal at Rochester, N. Y., be operated by the New York State Railways under a service-at-cost contract was the recommendation made by the Mayor's committee on subway operation in its report to Mayor Martin B. O'Neil. The report is the result of a two years study by the committee which was named by the late Mayor Clarence D. Van Zandt, Mayor O'Neil's predecessor.

The report suggests a three-year trial under a contract similar to the one by which the railway operates its bus and trolley system in the city, to be under the supervision of Charles R. Barnes, railway commissioner.

Under the plan submitted, the five steam railroads using the city railroad would have individual leases for interchanging freight cars over the line, but the motive power for the operation would be supplied by the New York State Railways. No terms other than that the passenger fare over the new railroad be 8 cents, the same as on the city lines, were suggested.

Under the proposed plan, if at any time returns from operation exceed \$100,000, the surplus is to be divided equally between the city and the general fare determining fund set up by the service-at-cost contract. At no time is the city to lose title to the property and at the end of three years a new plan can be tried out if the one suggested is not successful.

The line is nearly completed and it is expected that it will be in operation in the spring. The subway bisects the heart of the city and is designed to relieve traffic congestion by taking over interurban lines now on the surface and also to help industry by providing manufacturing plants with better switching facilities, in co-operation with the steam railroads. The subway is more than 8 miles long and for a mile in the downtown section is covered by an overhead street.

In making the report the committee stated that public service demanded the operation of the line be placed in experienced hands and that diversion of interurban or city trolleys would complicate any plan for operation by a city-owned or independent company. It was pointed out that the New York State Railways had the equipment, the experience and other essentials for carrying out the transportation program. It is generally believed that the New York State Railways will operate the railroad.

The Rochester Bureau of Municipal Research supported the report after an exhaustive study of municipal railroads in the United States. Stephen B. Story, director of the bureau, stated that the bureau's survey disclosed no project like the one attempted in Rochester. Mr. Story recommended an amendment to the service-at-cost contract to protect further the city's interests and asked that the contract be amended before a single car were actually put in operation.

The railway lines in Rochester have been operated for the past five years under the service-at-cost contract.

Dissension Over Fare Increase

Amsterdam Demands Return to Five-Cent Rate Following New Schedule Approved by Commission

The Common Council of Amsterdam, N. Y., made formal demand of the Fonda, Johnstown & Gloversville Railroad for a return to the 5-cent fare on the West Main Street branch, effective on Jan. 15. The demand is based on terms contained in a franchise granted several years ago for the establishment of the West Main Street division, which stipulates a 5-cent fare "from and to any part of the branch within the corporate limits of the city." A few years ago the Common Council waived this fare clause so that the company might increase the rate to a uniform 8-cent city fare. This uniform city fare was recently declared obsolete by Public Service Commissioner Van Voorhees when company officials appeared before him at Albany and asked for a 10-cent fare. Their request was granted. Amsterdam was the only city affected by the ruling which opposed the increase. In the resolution a provision was included that notice of the Council's action be forwarded to the Public Service Commission.

The Public Service Commission approved a new schedule of passenger fares on Nov. 12 to be charged by the Fonda, Johnstown & Gloversville Railroad on the electrically operated portions of the system. The commission found that the present maximum fares were insufficient to yield a reasonable compensation for the service rendered and that they do not yield a reasonable average return on the property used in public service.

In the commission's order, the fares fixed are as follows:

One-way interurban rate between Gloversville and Fonda and intermediate points and between Gloversville and Schenectady and intermediate points, now fixed at approximately 3 cents a mile, with a minimum fare of 6 cents, may be increased, but not to exceed 3½ cents per mile with a minimum fare of 8 cents. Round-trip tickets may be increased in the same proportion.

Fifty-four-trip commutation rates and 46-trip school rates on the interurban lines from Gloversville to Schenectady, inclusive, between Amsterdam and Hagaman and between stations on the Fonda Division from Gloversville to Fonda, inclusive, may be increased, but not to exceed 25 per cent in advance of the rates now being charged.

Twenty-four-trip commutation rates between Gloversville and Fonda and between Johnstown and Fonda may be increased, but not to exceed 25 per cent.

In all cases where local fares of 3 cents are now being charged the rate shall not exceed 10 cents. This rate is effective in the cities of Amsterdam, Johnstown and Gloversville. In all cases where 12-cent fares are being charged the rate shall not exceed 15 cents.

For school ticket books it shall not exceed a rate of \$5.30.

In place of four-strip tickets, for which a charge of 30 cents is now made, and twenty-trip coupon books, for which a charge of \$1.50 is now made, good in all cities and villages where the local 8-cent fare now applies, three-ride strips may be issued at a rate not to exceed 25 cents. Between Gloversville and Johnstown and between Amsterdam and Hagaman, where the regular single trip fare is now 12 cents, eight-trip tickets may be issued not to exceed \$1.

In the decision of the commission it was shown that \$66,982 was available for return on the property investment for the year 1925; this constituted a return of less than 2 per cent upon its

cost. This amount is the surplus after deducting from operating revenues the operating expenses, including taxes, and without including in operating expenses the additional yearly charge of 3 per cent for depreciation allowed in a former case involving the rate of the company.

The commission also rescinded its

order under date of Sept. 1, 1926, approving a declaration of abandonment of its Vrooman Street line in the city of Amsterdam. This order was based under existing rates of fare. The commission stated it is now of the opinion that the Vrooman Street line should be operated for a reasonable period of time under the new fare rate.

Street Traffic Survey of Chicago Completed

Report Based on Year's Study of Traffic Conditions in Streets—
Revised Traffic Regulations Recommended

BASED on studies of traffic conditions in Chicago, made during the course of the last twelve months, the Metropolitan Street Traffic Survey presents a complete and highly informative symposium on this most baffling of problems. At best, according to the report, the difficulties, bad as they are at present, are only beginning. With the growth of the city and the increased saturation of automobiles the number of vehicles in Chicago will probably increase from 350,000 at present to nearly 900,000 by 1950. Most of this is due to a growth in population, but partly to the increased saturation, which at present is 8.9 persons per car, and is estimated will be five persons per car in 1950.

Performance of street cars, as gleaned from the report, is one of the strongest testimonials for this type of mass transportation that can be found. Nearly a million rides into and out of the central business district are made every day between the hours of 7 a.m. and 7 p.m. on vehicles using the surface of the streets. Nearly 60 per cent of this traffic is in surface cars, which contribute only 8.4 per cent of the vehicles entering or leaving this district. Private automobiles, on the other hand, provide transportation for 33 per cent of the riders, but by using nearly 90 per cent of the vehicles. Accidents are also an important factor, but the street cars and elevated together cause only 5.4 per cent of the accidents in the city at large, while the automobiles cause 94 per cent.

Buses are of almost negligible value. As shown by the report, they provide transportation for only 9 per cent of the daily riders in and out of downtown Chicago. They constitute 1.8 per cent of the vehicles and produce only 0.7 per cent of the accidents.

Interterminal movement of L. C. I. freight is considered one of the most important factors in street congestion.

During March, 1926, 69,508,959 lb. of freight were moved in 13,806 loads over the streets of Chicago in purely interterminal transfer. In addition to this 16,283,879 lb. of freight in 1,803 loads moved between the docks of two boat lines and the freight terminals that are dotted around the edges of the central business districts. Many of these loads pass over the congested streets of the Loop.

The report and recommendations are contained in a printed volume of 292 pages, replete with tables, diagrams and views taken to illustrate the traffic situations discussed. The report proper is presented in thirteen chapters in

Part I and the recommendations in two chapters of Part II. Among the latter it is recommended that a street traffic commission be formed and a traffic engineering division, attached to the Bureau of Streets, functioning under the Department of Public Works. A reorganization of the traffic division of the Police Department is given in detail. Firmer and more systematic enforcement of traffic laws is considered essential, and many suggestions are made for traffic signs and signals to guide the motorists in the right use of the city streets.

The report is directed to the Mayor and City Council of Chicago and was made by the Chicago Association of Commerce at the invitation of the Council given in November, 1925. The report was signed by William R. Dawes, president of the association, and Elmer T. Stevens, chairman of the street traffic committee of the Commerce Association. Doctor Miller McClintock, director of the Albert Russell Erskine Bureau for Street Traffic Research at Harvard University, was engaged to direct the studies and prepare the report.

New Office Quarters of Brooklyn Railroads

The Brooklyn-Manhattan Transit Company, Brooklyn, N. Y., has leased six floors of the new Wittermann Building, or a total of 60,000 ft. of space, for a long term of years at an aggregate rental of approximately \$2,500,000. The Brooklyn City Railroad has leased an entire floor containing 10,000 ft., at an aggregate rental of about \$400,000 for the 20-year period.

The new building is a 35-story structure now in course of construction at De Kalb and Flatbush Avenues on the Flatbush Avenue extension. The present structures occupied by the railways as their office headquarters were owned by the Brooklyn City Railroad, but were recently sold by it. They are in the so-called financial district of Brooklyn, in which there has been a phenomenal rise in realty values in recent years. The building soon to be occupied by the railways for office purposes is equally as accessible from Manhattan as was the old one, and is in a new center of activity close to the business section of the borough.

The B. M. T. will occupy the eleventh to sixteenth floors inclusive of the new building and the Brooklyn City the tenth floor. Occupancy by them will date from April 1, 1928.

Electrification Report on Reading Expected Soon

Engineers who have been working out plans for the electrification of some of the lines of the Reading Company at Philadelphia are expected to have their report completed early next year. Before the survey is submitted, officials at the Reading Terminal anticipate, the preliminary plans for replacing steam with electricity will be completed covering the electrification of approximately 40 miles of line on the Chestnut Hill, Bethlehem and New York branches of the Reading system.

About a year ago the directors authorized the management to engage engineers to make a complete survey of the electrification project, but thus far no funds have been appropriated to carry out the operation.

The new service will be installed on the New York branch to Trevoise, Pa., a distance of 20 miles from the Reading Terminal at Twelfth and Market Streets, Philadelphia. The company now operates 35 suburban trains daily to and from Trevoise and 21 on Sundays.

From Jenkintown to Lansdale will add about 13½ miles more to be electrified on the Bethlehem branch.

The electrification of the Chestnut Hill branch will embrace about 5½ miles additional.

That section of the Reading system between the terminal at Twelfth and Market Streets and Jenkintown is included in the 20 miles of electrified line extending on the New York branch to Trevoise. This includes the line from Wayne Junction to Jenkintown.

It is said that power will be purchased from the Philadelphia Electric Company.

Where the Token Goes in St. Louis

The United Railways, St. Louis, Mo., has placed a large electrically illuminated and operated signboard on its property at Grand Boulevard and Park Avenue, to show the car riders passing that point "Where Your Token Goes." The board shows a young lady who deposits her token in payment of fare into the fare box of a car. As the token falls into the box a number of electric lines shoot from the token to various items listed on one side of the board, showing how the token is divided. It reveals, among other things, that 3.5 cents, or exactly half of the token, goes for wages, and another 1.5 cents for supplies.

Rochester Interurban Safety Contest On

An accident prevention contest will start between the trainmen on the Rochester & Eastern division and those on the Rochester & Sodus Bay division of the New York State Railways on Jan. 1. Each month the division operating the most car-miles an accident will be declared the winner and the head of that division will be awarded a banner reading "Safety Division." The number of points charged for various kinds of accidents, and other rules, will be the same as in the contest of the city lines.

An interurban motorman on the Rochester lines operating an entire year (2,700 hours) without an accident point charged against him will receive a \$2,000 insurance policy paying \$20 a week for sickness and accident disability. Interurban conductors will receive \$1,000 in insurance and \$10 a week for sickness and accident disability, the same as city conductors. The state appoints a committee for three months, consisting of one motorman and one conductor from each interurban line, who will meet each month in the office of the superintendent of the interurban division to make safety suggestions and review accidents of the previous month.

2,000-Mile Air Service Suggested by P. R. T.

An offer to operate a 2,000-mile air service, passenger and freight, between New York and Atlanta, and Chicago and New Orleans, with the government co-operating, was made on Dec. 7 to Secretary Hoover and Postmaster-General New by Mitten Management, Inc., operator of the Philadelphia Rapid Transit system, Philadelphia, Pa. Both federal department heads have commended the air line which the company established and maintained between this city and Washington for passengers and mail during the Sesqui-Centennial Exposition period, and the transit company has made it plain that it would undertake a more comprehensive service next spring if government support be assured.

In its five months operation the Philadelphia Rapid Transit air service carried 3,595 passengers. In his offer Mr. Mitten stated that the company was satisfied that transportation of passengers and merchandise was not only necessary to the success of commercial aviation, but that the revenue derived from such operation would equal approximately 50 per cent of total costs. The remaining 50 per cent the company hoped to secure through air mail by commitment of cities through which the company operated to use air mail to the extent necessary to assure quantity required.

Free Rides in Seattle Prove Success

The Seattle Municipal Railway, Seattle, Wash., which on two days, Nov. 26 and 27, carried shoppers downtown free for one-hour to start the Christmas shopping season, did a business unprecedented in its history. On Friday, from 9:30 to 10:30, the free hour, R. E. Furse reports the line carried 25,000 people. Fifty additional cars were operated and the passengers were carried expeditiously and without mishap. The railway, it is estimated, gained about \$4,000 in revenue during the two days from fares paid by the shoppers on their homeward bound trip. D. W. Henderson, superintendent, believes these shoppers will make frequent use of the cars during the holiday buying season. Downtown stores report the largest volume of business during any two days in November history.

More Men to Share in Los Angeles Awards

The merit and bonus system of the Los Angeles Railway, Los Angeles, Cal., is to be continued for 1927 under a new plan by which a larger number of men will participate in special awards. The main provisions follow:

The management sets aside \$5 a month for each man engaged in passenger car service six months or more and who performs satisfactory service, this bonus to be paid on Dec. 15 to those remaining in active service on Nov. 30, 1927.

Work in passenger service shall be construed as meaning the operation of passenger cars as motormen, conductors or safety operators.

No bonus will be paid men on sick leave, leave of absence, or working in other departments. Deduction from bonus will be made for all lost time in each calendar month in excess of five full or ten half days.

For the fiscal year 1927 special awards of two classes will be allowed.

First Class.—To all men in active passenger service who have not lost more than 60 days time, holidays excepted, and who have a clear courtesy and accident record, and who have received no demerits, will be awarded \$40 in cash.

Second Class.—To all men in active passenger service who have not lost more than 60 days time, holidays excepted, and who have a clear courtesy and accident record, and who have not been demerited more than three times, there being no repetitions under any one classification, and who have received no demerits for infractions of rules under classifications printed in caps on list of causes for demerits, will be awarded \$20 in cash.

Where it is found necessary to assess demerits against a man who has been previously demerited for the same offense during the past or present bonus year, the penalty will be from 25 demerits to removal from the service. Demerits will be assessed on recommendation of division superintendents, supervisors, instructors, safety men and others in authority. Deduction from bonus will be made at the rate of 25 cents for each five demerits assessed (five demerits equal 1 per cent) regardless of the efficiency rating shown on record.

When a man's efficiency rating drops to 75 per cent or below, he is subject to automatic dismissal from service. However, dismissal from service for certain offenses may be made regardless of efficiency rating.

Ten credits will be allowed each month for clear courtesy record, and ten credits for clear accident record.

No credits or demerits will be given during the first 90 days in service, and no bonus will be allowed for the first six months in service.

Demerits will be canceled only in case of an error in the report or extenuating circumstances, which must be explained to the satisfaction of the supervisor of merit system.

Appeals from dismissal must be made within three days. Appeals from demerits assessed must be made within 30 days.

One-Man Cars Win in Atlanta

The use of one-man cars in Atlanta, Ga., by the Georgia Railway & Power Company was upheld by the State Public Service Commission at a hearing conducted on Dec. 15. A petition asking that the company be restrained from operating one-man cars on two city lines—the South Pryor Street line and the River line, running between the city hall and the Chattahoochee River, —was presented to the Public Service Commission by R. O. Rivers and others representing residents in the sections served by the two lines. There are now more than 60 one-man cars in operation by the Georgia Railway & Power Company in Atlanta.

Utah Company Given Hearing

The case of the Salt Lake & Utah Railroad, Salt Lake City, Utah, which is seeking to retain its right to participate in westbound transcontinental rates and to secure the right to participate in eastbound transcontinental rates, was heard on Dec. 11 before the Interstate Commerce Commission. H. I. Moore, receiver for the company, made the principal argument for the carrier. A few years ago the commission permitted the Salt Lake & Utah to participate in westbound transcontinental rates, but a year later the order was reversed and the right of participation denied on protest of the Union Pacific and other carriers. The Salt Lake & Utah Railroad applied for a rehearing and the argument on Dec. 11 was in support of that application. Mr. Moore filed an extensively signed petition from shippers along the line of his road asking that it be accorded the privilege of participating in transcontinental rates eastbound and westbound and stating that denial of this privilege would work substantial hardship on them. If the last order of the commission should stand, all transit privileges would be denied, as well as the privilege of diverting traffic in transit. If the Salt Lake & Utah were allowed to participate in such privileges its financial condition would be improved, it is said.

Winter Ride-Selling Ideas at Levis

The Levis Tramways, Levis, Canada, whose success in various fare changes was mentioned in an article on "La Passe Hebdomadaire" in the *ELECTRIC RAILWAY JOURNAL*, issue of Dec. 11, page 1047, has lately added several winter ride-selling ideas under the direction of H. E. Weyman, general manager.

One innovation is an open-air skating rink at the old carhouse property on a hill. This is the first full-size rink ever constructed on the South Shore (opposite Quebec). It is well illuminated and has suitable accommodation for ladies and gentlemen. A popular added feature is a hockey team, which draws good crowds on Sunday afternoons and has induced the formation of other teams on the South Shore. Another feature for stimulating rides in winter has been the erection of a toboggan slide by the local

snowshoe club at a location of some advantage to the trolley.

Revenue for the pre-winter period July-November, 1926, shows an advance of 5 per cent over a similar portion of 1925, the increases coming in cash and weekly pass revenues. In this connection it may be well to call attention to the fact that the graph in the Dec. 11 article entitled "weekly passenger revenue only" should have ready "weekly pass revenue only."

Inquiry Into P.R.T. Service

An investigation of transit facilities in Philadelphia, Pa., is to begin shortly. This statement emanated from the Public Service Commission, which met in executive session in Harrisburg on Dec. 20. The state body will review car riders' complaints against alleged curtailment of service by the Philadelphia Rapid Transit Company and protests against that company's operating policies, which were brought to the attention of the Governor recently and upon which he ordered an inquiry.

Holyoke Makes New Contract for Power

The Holyoke Street Railway, Holyoke, Mass., has contracted to take power for the operation of its railway system from the Holyoke Water Power Company. The change went into effect on Dec. 5 and the power was generated at the No. 2 plant, which furnishes 2,000 hp. It is estimated the Holyoke Water Power Company will supply 500,000 kw.-hr. per month.

News Notes

Headquarters Changed.—The Connecticut Company has decided to remove its headquarters at Manchester, Conn., and combine it with operations at Hartford. Formerly runs to Rockville, Stafford Springs and other points had their headquarters at Manchester. These and also the Hartford-Manchester run will operate out of Hartford. This means that all rolling stock will be housed at Hartford and the old carhouse at Manchester will be sold.

Wages Increased.—Four hundred and fifty trainmen, employed by the Union Traction Company of Indiana, Anderson, Ind., are receiving pay under an increase in hourly wages recently granted. A flat raise of 2 cents an hour was granted. The new scale for city trainmen is 32 to 39 cents an hour. The new scale for interurban trainmen ranges from 41 to 46 cents an hour, based on the length of service.

Would Operate Over Extensions.—The Fresno Traction Company, Fresno, Cal., has applied to the Railroad Commission for a certificate of public convenience and necessity to operate over McKenzie Avenue and Fresno Avenue extensions of its line. These extensions were constructed under a franchise issued Dec. 21, 1922.

Retires After Fifty-seven Years.—Brayton D. Sweet recently retired as

superintendent of the Mount Pleasant division of the United Electric Railways, Providence, R. I., after serving the company for 57 years. Mr. Sweet is 73 years old and has been enrolled on the pension list. When invited recently to drop around to the carhouse a radio set was presented to him.

Trolley Guide in Washington.—With the co-operation of the Washington Railway & Electric Company and the Washington Rapid Transit Company, the Capital Traction Company of Washington, D. C., has printed a new issue of the trolley guide. The guide was designed primarily to assist visitors to the capital in finding their way to points of interest. It contains much valuable information for local residents, particularly those not entirely familiar with all the transportation lines of the city. It contains a map in red showing all the local transportation lines, street railways, the bus lines of the Washington Rapid Transit Company, the feeder bus lines of the two street railways and the route of the Chevy Chase Coach line.

P.R.T. Gets Radio Privilege.—A resolution giving the Philadelphia Rapid Transit Company, Philadelphia, Pa., exclusive use of the Camden municipal broadcasting station for one hour on alternate Mondays for six months beginning Jan. 3 was passed on Dec. 16 by the City Commission of Camden. While it is understood by the commission that the station will be used by the company mainly in sending out entertainment programs, no restriction was made in the broadcasting of other matter.

\$8,035 in Accident Bonus.—The Memphis Street Railway, Memphis, Tenn., will distribute among its crews \$8,035, being extra pay earned by the men in reducing the cost of accidents for the past three months. The savings effected during November were \$2,056. This sum added to the savings effected during September and October makes for the three months the total above.

New Directory in Baltimore.—The United Railways & Electric Company, Baltimore, has just issued a railway directory of the city as a help to all car riders. This has been sent out without charge with an attractive Christmas and New Year card inclosed. The public also has been invited to request copies of the directory. The directory includes a large map showing the route of every line operated by the company. Legends also show the terminals of the lines, Blue Bus lines, auxiliary bus lines, trackless trolley lines and short line routes. The routes of all the lines also are given in the directory. Other information of value to the car rider consists of the routes of all-night cars, a schedule of the first and last cars on weekdays, the routes of the buses and trackless trolleys.

New Arrangements for Supplying Current.—The Kewanee Public Service Company, Kewanee, Ill., may dismantle the old Wethersfield power house, which furnished current for the railway, and rent the property. Ten old cars are to be junked as the company will retain only the newer equipment. Current will be supplied through a hook-up with the interurban power line.

Recent Bus Developments

Would Stop Competitive Bus Operation in Louisville

James P. Barnes, president of the Louisville Railway, Louisville, Ky., and Churchill Humphrey, general counsel, are seeking to block the proposed bus endeavors of the People's Transit Company, which plans to operate buses in Louisville in competition with the railway. Threats of legal action were sent to Robert L. Page, attorney for the People's Transit Company. Mr. Barnes' letter reads as follows:

The Louisville Railway has seen your announcement that you propose to operate buses in competition with street cars on Broadway, Market Street and other streets. Before seeing you invest your capital in the prosecution of an enterprise of this kind I want to call your attention to the fact that such operation is a violation of the franchise rights of the Louisville Railway.

I also wish to advise you that in order to protect its franchise rights the Louisville Railway is prepared to, and will, invoke the full remedy afforded a property owner by the laws of the land.

A start was promised with the new service on Dec. 15, but institution of the service has been postponed.

Straps in New Jersey Public Service Buses

An order for hand straps for about 375 of its new gas-electric buses has been placed by the Public Service Transportation Company, Newark, N. J. These buses are already equipped with hand rails in front of the longitudinal seats on either side, but it is believed the hand straps attached to the hand rails will be an added convenience to passengers, especially in rush hours.

It is planned to install twelve hand straps in each bus, six on either side. The work of equipping the buses with these straps will be started as soon as the first consignment of the straps arrives.

Bus Substitution Opposed

Whether the United Railways shall be allowed to substitute bus service for railway service in Portland, Ore., on a line from 23d and Washington Streets to Mount Calvary Cemetery is under discussion. The matter was referred to the City Council by W. F. Turner, president of the United Railways and the Portland, Spokane & Seattle Railway. The Council, in turn, has placed the matter in the hands of Commissioner Mann.

The railway line affected starts at the end of the King's Heights line to the cemetery. The Mount Calvary line was built at about the same time as the King's Heights line and was connected with the lines of the Portland Electric Power Company and operated by that company. W. H. Lines, vice-president of the Portland Electric Power Company, stated that the abandonment of the Mount Calvary line would have "no immediate effect on either the Kings Heights line or the Arlington Heights line, not owned by

the P.E.P. company but operated at a loss.

H. M. Easterly, attorney for property owners who object to the removal of the tracks, stated that the United Railways, essentially a steam carrier, was obligated to continue the service as part of the price it agreed to pay for the use of street ends adjacent to the water-front, and that people had established their homes in the district under the impression that electric railway service was assured.

Transfers Bus Rights.—The Union Traction Company has been granted permission by the California Railroad Commission to transfer to the Auto Transit Company the operative right of the former for a bus service between Santa Cruz and Capitola and Santa Cruz and Twin Lakes and intermediate points. The purchaser is authorized to operate the same under the conditions now maintaining.

Want Bus Line.—People in the Farmington Avenue section of Bristol, Conn., have petitioned the Bristol & Plainville Electric Company to establish a bus line to cover their section of the city. This section is growing rapidly and many residences are under construction at this time and new subdivisions are being planned for spring expansion. The Bristol & Plainville Electric Company has surveyed suburban sections and found that so many house owners owned cars it would be unprofitable to open new lines. However, the section referred to is more densely populated now.

Bus Service to Open Soon.—Seven of the thirteen motor coaches which are to be operated in Nashville, Tenn., by the Tennessee Transportation Company are expected to arrive from Chicago shortly. The five routes they will serve have been approved by the City Council. The coaches, representing an investment of \$120,000, are of the street car type and equipped with every modern device. Each seats 29 passengers. The service to be operated is supplemental to and will be co-ordinated with the railway service of the Nashville Railway & Light Company. The coach lines extend principally into the rapidly growing suburban districts which are not afforded transportation facilities at the present time.

Allowed to Discontinue Bus Service.—The Aurora, Elgin & Fox River Electric Company, Aurora, Ill., has been authorized to discontinue its bus service between Aurora and Yorkville, marking the withdrawal of the utilities company from the down-river territory. The commission has granted the Cannon Ball Coach line a permit to cover that route. The interurban line was abandoned in 1924 and tracks and all equipment removed, after the line had been showing a deficit for several years. The bus line, which competed with the Cannon Ball, although the latter was restricted from serving the Aurora-

Yorkville territory, but included territory beyond those points, also failed to support itself.

Allowed to Provide Bus Service.—The Willapa Electric Company, Aberdeen, Wash., has been granted permission by the Department of Public Works to provide motor passenger service between Raymond and South Bend.

Bus Permit Granted.—A certificate has been granted by the Railroad Commission to the Los Angeles Railway Corporation, Los Angeles, Cal., to operate coach service for the transportation of passengers between Los Angeles and Culver City.

No Opposition to Bus Petition.—The Public Service Commission on Dec. 13 heard the application of the Eastern New York Transportation Corporation, a subsidiary of the Eastern New York Utilities Company, for a certificate for the operation of a bus line in the city of Hudson and town of Greenport and for permission to issue capital stock and sell the same to the Eastern New York Utilities Company. The purpose of the petition is to secure commission approval for the substitution of bus for railway service in the city of Hudson. No opposition was voiced.

Buys Bus Line.—Edgar L. Shepardson, president of the Templeton-Gardner Street Railway, Templeton, Mass., has announced the purchase of the Gardner to Winchendon bus line from the Flanagan Bus Company. Two modern buses are included in the deal, which it is expected will be approved by Selectmen of Winchendon, Baldwinsville and the City Council of Gardner.

Bus Extension Serves Rapidly Growing Section.—The San Diego Electric Railway, San Diego, Cal., has extended its bus service on the El Cajon Avenue line from Euclid Avenue to 56th Street at Redland Gardens. Although the railway felt that the bus line at this time would not entirely pay its total expenses, it believed that that section of the city was rapidly growing and that continual growth would bring about in time a profitable return. The through service to Redland Gardens is operated on a 40-minute headway. The extension from Euclid Avenue to Redland Gardens is covered by an additional 5-cent fare zone. However, the \$1 school pass is honored to the end of the line for students in that vicinity.

Will Fight for Bus Service.—The Key System Transit Company, Oakland, Cal., desires to substitute bus service for railway service on San Pablo Avenue between MacDonald Avenue and Alvarado Park, in Richmond, Cal. The City Council received a letter recently from George H. Harris, general manager of the company, asking the Council to reconsider its resolution of Nov. 9, when the railway was urged to double track the Alvarado Park line and make a complete loop connecting with the 23d Street line at San Pablo. Mr. Harris declared that a railway was dangerous to passengers boarding and leaving cars; that the large capital outlay in new rails and street paving was not justified; that the car line was operated at a loss, and, further, that bus service would be adequate for the district.

Financial and Corporate

Ogden Property Passes to New Hands

Control of the Utah-Idaho Central Railroad, Ogden, Utah, passed to new owners on Dec. 14. The line was purchased on Nov. 5 at a receivers' sale by a committee of bondholders for \$1,500,100. Acting under an order made by Judge Johnson of the United States District Court, P. H. Mulcahey, receiver and former general manager of the company, made the sale.

The present Utah-Idaho Railroad is an outgrowth of the joining of the street railway systems of Ogden and Logan. The consolidation was made in 1914 when the company was building the present line, which extends from Ogden to Preston, Idaho. When the company was formed it was known as the Ogden, Logan & Idaho Railroad. Early in 1919 the name was changed to the Utah-Idaho Central Railroad. Reference to the bondholders' taking over the Utah property was made in the *ELECTRIC RAILWAY JOURNAL*, issue of Nov. 20, 1926, page 948.

Commenting on the purchase the *Salt Lake Tribune* says that it is understood Mr. Singleton represents Kuhn, Loeb & Company of New York, the same concern which is behind the Missouri Pacific. The Missouri Pacific is half owner of the Denver & Rio Grande Western, which gives it a close connection with Salt Lake and an outlet over the Western Pacific to California. With the purchase of the Utah-Idaho Central and the expected extension of that line, it would provide, the *Tribune* says, not only a competing line into Idaho, but perhaps the northwest as well.

Small Illinois Properties Would Abandon Service

The Murphysboro & Southern Illinois Railway, which operates between Murphysboro and Carbondale, Ill., a distance of 8 miles, applied recently to the Illinois Commerce Commission for permission to discontinue service and did so on Dec. 13 on its line between Murphysboro and Carbondale.

The Murphysboro Electric Railway, Light, Heat & Power Company, operating in Murphysboro for 2 miles, has also asked for permission to quit the railway business, pointing out that it has not operated passenger cars since March 18, 1925, and that its freight business does not meet expenses.

Chicago City Protective Committee Appointed

M. A. Traylor, president of the First National Bank of Chicago, and John W. Esmond, vice-president of E. H. Rollins & Sons, have been elected members of the committee representing holders of Chicago City Railway first mortgage 5s and Calumet & South Chicago Railway first mortgage 5s. Mr. Traylor also

was elected acting chairman. Mr. Traylor is known nationally as a banker and corporation executive. He was recently elected a director of the General Electric Company.

Control of New York City Line Passes

Representatives of Fifth Avenue Coach Company Are Elected to Board of Surface Line

Improvement of the equipment of the New York Railways, New York City, operating about 70 miles of underground conduit railway, mostly in the Borough of Manhattan, is promised by John D. Hertz, chairman of its board of directors, in announcement of the policy of the new board elected as the result of the acquisition of control of the company by the Fifth Avenue Coach Company.

Mr. Hertz said:

It is our idea to make electric surface transportation in New York the best possible. This will involve an immense expenditure of money, even though the company is not earning a fair return on its present investment.

But, firm in the faith that we shall have the full co-operation of the public, we are about to begin an extensive program of improvements.

One of the first things to be done will be to array our equipment, so to speak, in a new suit of clothes and to keep the cars at all times fresh and clean.

We have the full co-operation of our employees, and a committee appointed for this purpose by the New York Railways Brotherhood has made suggestions to improve traffic conditions, which will be brought to the attention of the authorities.

Should motor coaches be required as the facility best adapted to the ends in view, the company stands ready to introduce them. In this the company has the advantage of connection with the Fifth Avenue Coach Company, the mother company of all city motor coach operation.

In a word, we aim to give the kind of transportation which will serve the public best and give the city of New York a pride in its existence. This is modern transportation.

Mr. Hertz announced the full board of directors of the New York Railways, the election of himself and seven other Chicago men having been made known previously. The Chicago members of the board are, in addition to Mr. Hertz: Edward N. D'Ancona, Albert Ettlinger, Leonard S. Florsheim, Albert D. Lasker, Charles A. McCulloch, Stuyvesant Peabody and John A. Ritchie.

Other new members of the board are John C. Jay, Robert Lehman, Grayson M-P Murphy, Charles H. Sabin, Elmer Schlisenger, David A. Schulte, Frederick Strauss, Edmond E. Wose and Frederic T. Wood.

Members of the old board who were re-elected are Harry Bronner, J. P. Cotton, George B. Gibbons, Samuel L. Martin, H. J. Sheeran and Willis D. Wood. Five members of the old board resigned, Haley Fiske, Henry V. Poor, Boykin Wright, J. J. Heffernan and W. G. Strait.

The New York Railways, with the Fifth Avenue Coach Company, is an applicant for a bus franchise for Manhattan.

Depreciation Credit Systems Made Uniform in Washington

The Capital Traction Company, Washington, D. C., has been ordered by the Public Utilities Commission to change its system of accruing depreciation so that it will conform to the method tentatively adopted in the commission's valuation order of 1919. The order was issued as a result of a conference with officials of the company.

In 1919, when the commission laid down a rule for depreciation, various terms of obsolescence were fixed for the respective items of the equipment of the railways, which resulted in a bookkeeping charge roughly averaging 2.52 per cent of the total value. The same year, and again in 1920, the Capital Traction Company increased its depreciation reserve so that it finally became about 3 per cent. The Washington Railway & Electric Company made no change in its system of accounting for depreciation so that the commission's order makes the method of accruing depreciation uniform.

Passenger Figures at Madison

Figures filed with the Railroad Commission of Wisconsin by the Madison Railways, show that for the first ten months of the year the company carried 325,158 railway passengers compared with 325,665 for the similar period in 1925. However, 32,100 motor coach passengers were carried up to the first of November this year, compared with only 11,537 during the corresponding months last year.

The report on October business reveals that while the number of street car passengers fell off as compared with the 1920-1924 four-year average, the total of street car and motor coach passengers carried in October, 1926, was 531,105 as against 528,388 in October, 1925, an increase of 2,717. Other figures on the Madison Railways business for October, 1926, follows:

Total railway passengers, October, 1926, 479,473; railway passengers for the four-year average, 1920-1924 (average), 572,565; gross railway and motor coach revenue, October, 1926, \$36,295; gross railway and motor coach revenue, October, 1925, \$36,077, an increase of \$218.

Unification of Lines in Hannibal

Controlling interest in the Hannibal Railway & Electric Company, Hannibal, Mo., has been purchased by stockholders of the Hannibal Transportation Company, operating the city bus company. The properties will be unified on Jan. 1 with an interchange of transfer and transportation facilities. Under the new ownership officers of the Hannibal Railway & Electric Company are: Frank T. Hodgdon, president; Carl D. Sultzman, vice-president; Dan H. Hafner, Jr., secretary, and S. O. Oserhout, treasurer. Clair Mainland remains as general manager of the company. Carl D. Sultzman is president of the Hannibal Transportation Company; Dan H. Hafner, Jr., secretary, and S. O. Oserhout, treasurer. The electric railway recently sought permission to curtail service.

Lincoln Ready to Relinquish Railway Lines

The Lincoln Water & Light Company, Lincoln, Ill., has notified the City Council that within six months it will relinquish operation of the railway, originally a municipal project. After the city failed to operate the lines at a profit, they were taken over by the Lincoln Water & Light Company with provision that either could cancel the contract on six-months notice. A few months trial convinced the utility that the lines could not be made to pay.

Orders Abandonment of Kite Route

Judge J. Foster Symes, in the federal district court at Denver Col., Dec. 10, instructed W. H. Edmunds, receiver of the Denver & Interurban Railroad (Kite Route), operating between Denver and Boulder, to cease operation of the railroad. The court's order was the result of the suit brought by the Guaranty Trust Company, New York, trustee, representing the holders of \$1,250,000 in bonds, on which interest is in default, and the further proof that so far this year the road has been operated at a loss of \$57,000, with a cumulative loss of \$75,000 during the past five years.

The date for cessation has not been announced. The owner, the Colorado & Southern Railroad, is operating its steam trains daily as well as a bus line between Denver and Boulder.

In passing upon the contract between the electric line and the city of Boulder, the court said such contract did not bind the road to operate at a loss. Attorneys for the city of

Boulder told the court that it had unlimited power to issue receiver's certificates and should do so to keep the road in operation. The court answered that it did not so understand the law and that there was no visible means of the road improving its earning power. The contract mentioned expires in June, 1927.

Will Seek Tax Reduction.—The city of Hutchinson, Kan., will not take over the Hutchinson Interurban Railway and operate it as a municipal utility although the company is about to be sold because of failure to pay back taxes. The City Commission was considering taking over the railway and operating it, but finally decided to make an appeal to the State Tax Commission for the reduction of assessments. The system now is operating under a trustee for the bondholders.

Railway Traffic to Be Rerouted.—Mayor Jermyn of Scranton, Pa., recently announced that the Scranton Railway had agreed to carry out its part of a rerouting program and had made provision in its 1927 budget for the work. The scheme is to be tried out for some time before any of the proposed abandoned tracks are removed. This rerouting of street car traffic in the central part of the city has been suggested as an aid in eliminating much of the traffic congestion.

Would Issue Common Shares.—For the purpose of reimbursing its treasury for money which it said it had spent out of its current income, the Interstate Public Service Company of Indianapolis, Ind., an Insull utility, has asked the Indiana Public Service Commission for

authority to issue 8,370 shares of common stock of no par value. It expects to derive \$627,716 from the issue. The money was spent, the petition said, to make up deficiencies for refunding purposes for which a \$7,384,900 refunding bond issue was approved by the commission on Dec. 7.

Additional Issue Offered.—A syndicate headed by Harris, Forbes & Company is offering at 97 and interest, yielding about 5.20 per cent, an additional issue of \$7,500,000 Illinois Power & Light Corporation first and refunding mortgage gold bonds. The series, known as "C," 5 per cent thirty years, is dated Dec. 1, 1926, and is due Dec. 1, 1956.

Authorized to Sell Bonds.—The Key System Transit Company, Oakland, Cal., has been authorized by the California Railroad Commission to issue and sell for cash on or before April 30, 1927, at not less than 96 per cent of face value, plus accrued interest, \$1,500,000 of its series "D" first mortgage 6 per cent bonds, due July 1, 1938, and to use \$770,161 of the proceeds to reimburse its treasury for expenditures for additions and betterments.

Substitutes One Line for Another.—The Sacramento Northern Railway, Sacramento, Cal., has been authorized by the Railroad Commission to discontinue railway service and to abandon and remove its tracks and equipment on its Park Avenue, Sixteenth, Mulberry Streets branch and to substitute in place thereof an extension of its Sixteenth Street line to Twentieth Street.

Track Abandonment Approved.—The abandonment of car tracks on Indiana Avenue in Toledo, Ohio, sought for several years, has been approved by the City Council at its meeting Dec. 6. Provision is made that the tracks must be removed before April 1, 1927. The line was one of those running into a territory which was considered to have adequate service from parallel routes.

Would Abandon Interurban.—The Portland Electric Power Company has filed with the Public Service Commission of Oregon a petition asking for permission to discontinue its interurban railway service between Montavilla and Troutdale by way of Ruby Junction. This division, the company claims, has been a money loser for years and shows a deficit of \$34,074 for the first ten months of 1926. The steady decline in revenues in this territory is said by the Portland Electric Power Company to be directly attributable to bus and truck lines which have established service on the route. The company is faced with the need for rehabilitating the road physically, and says the expenditures that would be necessary for this purpose are not warranted by prospective business.

Increased Patronage Reported.—For the first time in weeks the report of the Omaha & Council Bluffs Street Railway, Omaha, Neb., shows an increase. The last nine days in November, as reported to the Nebraska Railway Commission, show a 2.16 per cent increase in the number of passengers carried over the corresponding period of 1925, the respective figures being 1,428,400 in the year 1926 and 1,398,106 in the year 1925.

Conspectus of Indexes for December, 1926

Compiled for Publication in This Paper by
ALBERT S. RICHEY
Electric Railway Engineer, Worcester, Mass.

	Latest	Month Ago	Year Ago	Since War	
				High	Low
Street Railway Fares*	Dec. 1926	Nov. 1926	Dec. 1925	Nov. 1926	May 1923
1913 = 4.84	7.42	7.42	7.30	7.42	6.88
Electric Railway Materials*	Dec. 1926	Nov. 1926	Dec. 1925	Sept. 1926	Oct. 1924
1913 = 100	159.2	156.6	153.9	247.5	148.5
Electric Railway Wages*	Dec. 1926	Nov. 1926	Dec. 1925	Sept. 1926	Mar. 1923
1913 = 100	226.3	226.3	223.0	232	206.8
Am. Elec. Ry. Assn. Construction Cost (Elec. Ry.) 1913 = 100	Dec. 1926	Nov. 1926	Dec. 1925	July 1926	May 1922
	203.2	203.7	202.2	256.4	167.4
Eng. News-Record Construction Cost (General) 1913 = 100	Dec. 1926	Nov. 1926	Dec. 1925	June 1926	Mar. 1922
	210.8	210.8	206.0	273.8	162.0
U. S. Bur. Lab. Stat. Wholesale Commod- ities 1913 = 100	Nov. 1926	Oct. 1926	Nov. 1925	May 1926	Jan. 1922
	148.1	149.7	157.7	246.7	138.3
Bradstreet Wholesale Commod- ities 1913 = 9.21	Dec. 1 1926	Nov. 1 1926	Dec. 1 1925	Feb. 1 1926	June 1 1921
	12.78	12.74	14.41	20.87	10.62
U. S. Bur. Lab. Stat. Retail Food 1913 = 100	Nov. 1926	Oct. 1926	Nov. 1925	July 1926	Mar. 1922
	161.6	160.0	167.1	219.2	138.7
Nat. Ind. Conf. Bd. Cost of Living 1914 = 100	Nov. 1926	Oct. 1926	Nov. 1925	July 1926	Aug. 1922
	168.2	167.2	171.8	204.5	154.5
Steel Unfilled Orders (Million Tons) 1913 = 5.91	Nov. 30 1926	Oct. 31 1926	Nov. 30 1925	July 31 1926	July 31 1924
	3.807	3.684	4.582	11.118	3.187
Bank Clearings Outside N. Y. City (Billions)	Nov. 1926	Oct. 1926	Nov. 1925	Oct. 1925	Feb. 1922
	18.24	19.75	18.60	20.47	10.65
Business Failures Number Liabilities (Millions)	Nov. 1926	Oct. 1926	Nov. 1925	Jan. 1924	Aug. 1925
	1611 56.99	1420 39.82	1462 42.78	2211 122.95	1353 27.22

*The three index numbers marked with an asterisk are computed by Mr. Richey, as follows: Fares index is average street railway fare in all United States cities with a population of 50,000 or over except New York City, and weighted according to population. Street Railway Materials index is relative average price of materials (including fuel) used in street railway operation and maintenance, weighted according to average use of such materials. Wages index is relative average maximum hourly wage of motormen, conductors and operators on 137 of the largest street and interurban railways operated in the United States, weighted according to the number of such men employed on these roads.

James H. McGraw Honored

Tribute Paid to Him by Engineers, Industrialists, Educators, Business Associates and Others in Recognition of His Work for Technical and Business Journalism

MORE than 1,000 representative men engaged in engineering, education, publishing and other callings attended a dinner at the Hotel Astor, New York, on Friday evening, Dec. 17, arranged as a tribute to James H. McGraw as a publisher, a leader of industry and a man. The immediate occasion was Mr. McGraw's 66th birthday anniversary, which coincided with the completion of more than 41 years of activity in the field of industrial and technical publishing. In this period the McGraw-Hill Publishing Company, Inc., of which he is president, has grown from small beginnings to its present magnitude.

John W. Lieb, vice-president New York Edison Company, was toastmaster. Before he called on the speakers chosen to represent various business and professional interests, Mr. Lieb sketched Mr. McGraw's career briefly, dwelling for a minute on the comprehensive nature of the McGraw-Hill publications, which, he pointed out, were not confined to the electrical field but covered nearly all branches of engineering and the general interests of industry.

Willits H. Sawyer, president of the American Electric Railway Association, was the first speaker. He told what Mr. McGraw's counsel and leadership had meant to the electric railway industry, recalling that the publisher's first journalistic venture had been in the street railway field 40 years ago. This industry, he said, in spite of temporary adversity, must and will go forward. The McGraw-Hill papers have pointed the road to constructive co-operation and co-ordination in the transportation field. He called the guest of the evening a "fountain of well-directed enthusiasm" and read a testimonial to him on behalf of the A.E.R.A., in substance as follows:

The electric railway industry appreciates that as head of the largest industrial paper publishing house in the world James H. McGraw is an outstanding, commanding figure in the industrial life of this nation, but we of the electric railway industry regard him as signally our own. Practically since the first of our industry he has been a guiding influence and has given to us

largely and extensively of his wise and helpful leadership. His far-seeing vision, his unwavering confidence in our industry, his constructive policies have been the foundation stones upon which we have builded. No one among us has been more insistent that the changed condition of to-day should be met by modernized equipment. At all times he has zealously urged us to sell worth-while, desirable service and freely to utilize frank, attractive publicity, especially of late years when our industry has been pressed by seemingly insurmountable



JAMES H. MCGRAW

difficulties. His confidence and his guidance have been both a challenge and an inspiration. Over the period of the last 40 years no other man affiliated with our industry has been more of an inspiration or has contributed more to its upbuilding and progress.

Gen. Guy E. Tripp, chairman of the board of directors of the Westinghouse Electric & Manufacturing Company, who was called on to represent the manufacturing interests, refused, in a witty speech, to "catalog" Mr. McGraw, but referred to him as a "practical philosopher." Idealism was one of the

foundation stones on which the publisher had built. General Tripp suggested that engineers were not sufficiently tolerant of the imaginative and romantic element in their calling. Had they grasped more fully the opportunities to interest the public in this aspect of their work, he thought that Governor Pinchot's visualization of "giant power" and Professor Ripley's attack on holding companies might have lost much of their popular appeal, for the public would have had a sounder conception of superpower and would understand that the holding company is the only feasible instrument by which its advantages can be realized. The speaker suggested

in a semi-humorous vein that Mr. McGraw start a new publication devoted to the sociology of business.

Charles L. Edgar, president of the Edison Electric Illuminating Company of Boston, spoke for the light and power industry. He dwelt on the relation between journalism and the industry; he praised the *Electrical World* for its unbiased and open-minded attitude toward all electric light and power problems. Mr. McGraw, the speaker said, had the faculty of making the busy leaders of the electric light and power industry contribute in their turn to the papers he publishes, drawing from these leaders their best thought. He was an outstanding example of the spirit of co-operation.

A scholarly address was contributed by Dean Dexter S. Kimball of the College of Engineering at Cornell University, speaking for engineers. He emphasized the superior endurance of the written word as compared with that merely spoken, and associated Mr. McGraw and the publications of his company with the spirit of engineering and science. For the first time in the world's history, Dean Kimball said, hope of universal

well-being is held out to a great nation. The problems of production had been solved in the main; those of distribution were not yet entirely worked out. In their solution and in the promotion of engineering knowledge, for which the people were now eager, and the development of the economic side of industry, the publications of Mr. McGraw were taking a noteworthy part.

Edward J. Mehren, vice-president McGraw-Hill Publishing Company and chairman of the editorial board of the company, spoke for Mr. McGraw's asso-

ciates in business, dwelling on the principles that the publisher had set up to govern his technical, trade and industrial papers. These papers, he said. Mr. McGraw desired to be collectors and distributors of information, interpreters of events and trends in their respective industries and promoters of sound thought and policy. Imbued with an intense spirit of service, Mr. McGraw possessed faith illumined by vision, courage and perseverance. He insisted on a superior product, minute specialization, intimate contact with leaders in the field and intense application characterized by hard work and sacrifice. Mr. Mehren concluded with this tribute to his chief:

HIS EFFORT TO BUILD AN INSTITUTION

"That he might build an institution that could valiantly serve engineering and industry, that could help lead them to higher ideals and greater effectiveness, that could help solve their baffling problems, that could make them better agencies for engineers, owners, managers, employees and the general public, whom, in the last analysis, we all serve—such has been his ambition, such has been his very life."

Responding to the call of the toastmaster, Mr. McGraw thanked his audience for the tribute paid him, but insisted that the leaders of industry who so honored him were themselves worthy of commendation, for without their co-operation his efforts would not have borne fruit.

"It is beyond me adequately to express my appreciation of this tribute," said Mr. McGraw.

"That there has been a certain accomplishment your tribute forces me to admit. I wish that the accomplishment might have been larger and that the service rendered to you, your professions and your industries might have been even more intimate and effectual. But whatever the accomplishment, it would not have been possible without the ardent co-operation of two important groups:

"The first of these consists of my own loyal and competent associates in the McGraw-Hill Publishing Company, the McGraw-Hill Book Company and their subsidiary organizations.

"The second group which has been essential to whatever accomplishment there has been is composed in their entirety of the professions and industries which you represent. It has always been my thought that our publishing enterprises, both magazines and books, have been an intimate part of the professions and industries.

HIS GRATITUDE TOWARD OTHERS

"A great satisfaction that I take out of this evening's meeting is that it gives me an unusual opportunity to express in this public way my gratitude to the engineers and industrialists of America for the parts they have played in making possible McGraw-Hill magazines and McGraw-Hill books. Without you, our work could not have been done. Without you, our institutions could not have existed. I thank you heartily for your help, and believing, as I do, that our institutions can be of still larger service, I pray your co-operation for the future.

"We have never wanted to stand alone in any effort if other agencies could help, nor did it matter whether we or some one else originated the idea. Our part would be played as vigorously in the one case as in the other. We have, therefore, co-operated with all agencies which have worked in a forward-looking attitude for the advancement of engineering profession and industry; we have co-operated with the engineering societies, national and local with trade and industrial associations of every kind; with government agencies; with research bureaus."

Of his association with men in industry, Mr. McGraw said that the engineers and industrialists with whom he had worked had remade the physical conditions of the civilized world in these 40 years. "To work with you, and the thousands of your fellows whom you represent tonight, has been a source of constant inspiration," he said. "To serve you, to help you in your developments in engineering and industry has been an inestimable privilege."

In conclusion Mr. McGraw said: "For

the privilege of having served in this ministry I have you to thank, for your co-operation has made it possible. With all my heart I thank you for the privilege. With all my heart I thank you for your tribute this evening."

At the speakers' table, besides the guest of honor, were Arthur Williams, chairman of the dinner committee; Charles L. Edgar, Thomas E. Murray, Walter R. Addicks, Gerard Swope, M. S. Sloan, W. W. Freeman, E. M. Herr, Frank W. Smith, Willits H. Sawyer, Edward J. Mehren, Dexter S. Kimball, Guy E. Tripp, Philip G. Gossler, Martin J. Insull, William L. Ransom, H. M. Edwards, Robert Ridgway, George S. Davison, E. H. Rosenquest, Calvin W. Rice, Fred R. Low, John V. W. Reynolders, A. L. Salt, Philip Torchio, J. Waldo Smith, George F. Kunz, C. Stanley Mitchell and Newcomb Carlton.

Mr. Williams read a telegram from Thomas A. Edison, honorary chairman of the committee, expressing regret at his inability to be present, and similar telegrams from Judge E. H. Gary, Secretary Hoover, Secretary of War Davis, John Hays Hammond and others.

Personal Items

Changes in New Jersey Personnel

Under a rearrangement of positions in the transportation division of Public Service Railway, Newark, N. J., Louis P. Baurhenn, now general superintendent, becomes director of personnel; Arthur T. Warner, now assistant to the vice-president in charge of operation, becomes general manager in charge of traffic, and Martin Schreiber, now manager of the southern division of the transportation lines, becomes general manager in charge of plant of the entire system. All three are newly created positions and the three heads will report to M. R. Boylan, vice-president of the Public Service Railway and the Public Service Transportation Company.

George A. Rothery, chief assistant in the Camden offices, will succeed Mr. Schreiber as southern division manager, and Claude L. Sell, superintendent of employment at the same office, will become assistant manager.

Mr. Warner entered the employ of the Public Service Railway June 27, 1910, as a cadet engineer five days after he was graduated from Lafayette College as an electrical engineer. His first job was in the pits at the Newark car shops. He was made traffic engineer Jan. 1, 1916. He became assistant to Mr. Boylan when the latter was made acting general manager in 1923. He is president of the public service section of the American Electric Railway Association.

Mr. Schreiber was graduated from Ohio State University with the degree of mechanical and electrical engineer. His first street railway experience was with the Cleveland Electric Railway as an electrician. He was appointed manager of the southern division of the Public Service Railway on Sept. 1,

1920. As chief engineer he was in charge of the construction of the Public Service Terminal building in Newark.

Mr. Baurhenn began railway work with a New Orleans company. In 1900 he went to New Jersey to become general shop foreman in charge of transportation of the Bergen County Traction Company at Edgewater. When the New Jersey & Hudson River Railway & Ferry Company took over the Bergen County Company Mr. Baurhenn became superintendent and purchasing agent of the new company and continued after the Public Service took over the latter company in 1911. In August, 1918, he was made assistant general superintendent and on Dec. 1, 1923, general superintendent.

New Personnel on Ogden Property

M. E. Singleton is president of the Utah-Idaho Central Railroad, Ogden, Utah, which recently passed to new owners. Mr. Singleton is president of the Missouri State Life Insurance Company, St. Louis.

A. B. Apperson is executive vice-president of the Ogden property. He is a railroad man and coal operator of Denver. Joseph Scowcroft is vice-president.

Howell Ellis, secretary of the Indiana Public Service Commission since April, 1925, has been appointed a member of the commission to succeed Samuel R. Artman, who was named by Governor Jackson to membership on the State Industrial Board. The appointment is for the unexpired term which ends next May. Before he joined the commission Mr. Ellis covered statehouse news for the Indianapolis *Star*.

Pittsburgh Plan Operating

Messrs. Loftis, Fink, McCarthy, Bull, Leschke and Williams
in New Roles in Departmental Activities

THE new form of railway supervision, based upon a policy of making each executive assume entire responsibility for his own departmental activities, is now functioning in the Pittsburgh Railways, Pittsburgh, Pa. Approval of this plan, which solidifies and systematizes the entire structure of the organization, was referred to in the *ELECTRIC RAILWAY JOURNAL*, issue of Nov. 6, 1926, page 866.

In this new scheme, J. M. Loftis, veteran superintendent of transporta-

Another, so far unchosen, will be made superintendent of trainmen's instruction and will have charge of training along lines of proper handling of cars, safety and courtesy.

W. T. Rossell, in announcing the reorganization of the transportation department, also announced a reorganization and simplification along similar lines in the mechanical department. Hitherto, in this department, the duties were handled through assistants, but under the present plan one man will definitely have charge of each branch, with closer supervision and increased responsibility.

Direction of both carhouse and shop equipment has been placed in the hands of Richard S. Bull, who was formerly shops superintendent, while all track, right-of-way, buildings and other structures will come under the charge of Oscar Williams, with the title of superintendent of way and structures. A. H. Leschke, formerly maintenance engineer, is now operating engineer, with jurisdiction over both transportation and maintenance, and M. W. Cooke, formerly chief of current control, has been appointed superintendent of power and inclines.

It is believed that with this new method of grouping all of the duties of the departments and allocating them under one head a closer supervision, with a consequent greater efficiency, will result. Brief biographical facts of the new incumbents follow:

CAREERS OF NEW INCUMBENTS REVIEWED

J. M. Loftis, in charge of transportation, started on his railway career in Wheeling, W. Va., in 1888. In October, 1889, he went to Pittsburgh with the Citizens Traction Company, one of the underlying companies of the Pittsburgh Railways, and served in the capacities of track repairman, power house repairman, watchman, gripman on the cable road, dispatcher, inspector, division superintendent and superintendent of transportation.

He was born in Randolph County,

West Virginia, and attended public schools there. As a boy he worked in the lumber woods and later in the steel mills.

A. J. Fink, who will report to Mr. Loftis, went to Pittsburgh in 1920 to become associated with Mr. Fitzgerald, who at that time was consulting engineer for the Philadelphia Company working on the reorganization of the Pittsburgh Railways. After the reorganization of the railways in February, 1924, Mr. Fink was appointed assistant to general manager, in which capacity he served until November, 1926, when he was appointed to his present position of superintendent of traffic and schedules.

Mr. Fink was born in Cincinnati,



J. M. Loftis

tion, has been placed in charge of three distinct functions of street railway transportation, namely, traffic and schedule, car operation and trainmen's instruction, with a superintendent appointed to head each branch. A. J. Fink, formerly assistant to the general manager, has been appointed superintendent of traffic and schedules, with the responsibility of keeping the street cars moving and seeing that the service is carried through. Frank W. McCarthy, who was formerly assistant superintendent of transportation, has been placed in charge of car operation, with the additional task of supervising the activities of the men at the carhouses.



A. J. Fink

Ohio, and was educated in the Cincinnati schools. In 1905 he entered the service of the Cincinnati Traction Company, being employed in the operating department until the early part of 1920.

F. W. McCarthy, another superintendent under Mr. Loftis' supervision, has been identified with Pittsburgh tractions since 1898, when he entered the employ of the United Traction Company in 1898 as cashier. When the United Traction Company was taken over by the Pittsburgh Railways in 1902 he became clerk to the superintendent of the Second Avenue division. The same year he was transferred to the general office, to a position of



F. W. McCarthy



R. S. Bull



A. H. Leschke



Oscar Williams

clerk to superintendent of transportation. Mr. McCarthy was appointed secretary to the president in 1907 and assistant superintendent of transportation in 1913. On Nov. 1 last he was appointed superintendent of car operation.

Richard S. Bull, the new superintendent of equipment, entered the employment of the Pittsburgh Railways on Oct. 1, 1906. He started as a meter reader, from which position he has steadily advanced through the various stages of draftsman, assistant superintendent of overhead lines and engineer of car equipment, to the position of superintendent of equipment, having jurisdiction over the shops and carhouses of the Pittsburgh Railways.

Mr. Bull received his early education in the public schools of New Hartford, Conn., his birthplace, and the Gilbert high school at Winsted, Conn. He was graduated from Pratt Institute, Brooklyn, in 1906. Mr. Bull's first position after completion of his engineering course was with the United Switch & Signal Company as an apprentice. He remained there only a few months, and then entered the service of the Pittsburgh Railways.

A. H. Leschke, who will serve in both the transportation and maintenance departments, has been connected with both steam railroads and electric railway enterprises. His first position was with the Baltimore & Ohio Railroad, as a student employee, and he subsequently held various positions in the operating vice-president's department. His work was interrupted by the World War, in which he enlisted in the army as a private in 1918 and rose to the rank of first lieutenant in the Engineering Corps. At the close of the war Mr. Leschke returned to the employ of the Baltimore & Ohio Railroad. On Jan. 1, 1921, he entered the commercial development department of the Philadelphia Company as an investigator, later becoming statistician in the office of the financial assistant to the president. In February, 1924, he was made research engineer in the newly organized research department of the Pittsburgh Railways. In July, 1925, Mr. Leschke was appointed maintenance engineer in the maintenance department, and on Oct. 1, 1926, was promoted to the position of operating engineer in the operating department.

Mr. Leschke was born in Hartford, Conn., and attended the grammar schools and high school of that city. He entered Trinity College, Hartford, and later went to the University of Wisconsin, from where he was graduated in the civil engineering course.

Oscar Williams, superintendent of way and structures, entered the service of the Pittsburgh Railways in 1901 in the engineering department as rodman. He rose steadily, becoming supervisor of interurban lines in 1911, supervisor of Pittsburgh and Rankin lines in 1919, superintendent of maintenance in 1924 and a year later superintendent of way. This year he was promoted to the position of superintendent of way and structures.

Mr. Williams was born in Cleveland, Ohio. He received his early education in Pittsburgh schools and in the Central high school.

Manufactures and the Markets

News of and for Manufacturers—Market and Trade Conditions
A Department Open to Railways and Manufacturers
for Discussion of Manufacturing and Sales Matters

Buses on the "Air"

Frank Weitz of Lang Body Company
Gives a Radio Talk on Development of the Bus Industry

"Bus Transportation" was the subject of a ten-minute radio talk which was broadcasted from station WHK at Cleveland, Ohio, on Thursday evening, Dec. 9, by Frank Weitz, head of the research and experimental department of the Lang Body Company. It was one of the first occasions, if not the pioneer, that this subject had been brought to the attention of the public in such a fashion. Significant was the fact that Mr. Weitz, in tracing the history and development of the bus industry, made it very clear that it is in the field of co-ordinated transportation that the bus has found its greatest sphere of usefulness.

In addition to the talk by Mr. Weitz, the Lang Body Company orchestra played a number of selections. Telegrams and letters from various sections of the country have been received by the sponsors of the program, commending both the orchestra and the speaker upon the excellence and interest of their respective contributions.

First tracing the growth of the transportation industry in this country from its humble beginnings in the days of the stagecoach, Mr. Weitz pointed out the tremendous advances which have been realized in the relatively few years just past by electric and steam railroads, and he indicated that the next decade will show even greater progress in modernization work.

BUS HAS RAPIDLY FITTED ITSELF INTO TRANSPORTATION SCHEME

The speaker next discussed the manner in which the bus has established its importance as an aid to flexibility in transportation service:

Great as the development of the steam and electric roads has been, they have been unable to cope with the ever-increasing demands of our rapidly growing and spreading cities and towns. The enormous cost of trackage, right-of-way, power house equipment and other items incidental to the expansion of steam and electric roads have resulted in creating an imperative need of a more flexible form of transportation—a form of transportation that could at a reasonable cost reach those who have established homes in localities far removed from existing steam and electric lines. This need for a flexible and economical mode of transportation has been filled by the use of motor coaches or buses.

In our modern city today street car service has been supplemented by motor bus or coach service and we reach with ease the most isolated and otherwise inaccessible parts of our suburban and outlying communities. Many independent bus operators reach out into our more distant neighboring cities or towns and there has been developed a network of transportation lines which serve us for our every requirement.

Those accustomed to riding in their own private cars, who have not as yet experienced the thrill and comfort of riding in the modern bus of today, will find quite a surprise in store for them. Those living in the city will find it convenient, comfortable and safe to use bus transportation; the hazard and responsibility of operating your own car and the annoyance of

finding suitable parking space when shopping or attending the theater are eliminated. The suburbanite, when using the intercity bus with its comfortable, luxurious seating capacity, will find it is more convenient and more restful than using his own private car.

Electric railways today are operating approximately 6,400 buses, which include both the city and intercity types. Motor bus transportation has invited and brought to it new patrons, among them the traveling salesman, who has noticeably increased his sales volume because the bus enables him to reach isolated points in a very short space of time. The motor bus takes him wherever he wants to go with the least possible inconvenience and loss of time.

After citing a large number of steam railroads and electric railway properties which have entered the bus operating field on a comparatively large scale, Mr. Weitz concluded his remarks with a tribute to various manufacturers of bus equipment, as follows:

Among those who have been most prominently identified in building bus transportation more efficiently, both from the standpoint of economy to the operator and safety to passengers, are such companies as International Harvester Company, American Car & Foundry Motors Company, Fageol Motor Car Company, Mack-International Motor Truck Corporation, Yellow Truck & Coach Manufacturing Company and the White Company. The Lang Body Company has been identified with all these companies in developing the highest possible type of bus body equipment.

Modern Gear Case Manufacturing

Since its fire last August the Chillingworth Manufacturing Company, Jersey City, N. J., has remodeled its gear case plant and is now manufacturing on a 24-hour daily schedule. The company states that the new machinery and methods which have been recently introduced will augment its ability to manufacture more economically than heretofore by increasing production and permitting more rapid shipments. Modern lighting and heating systems have been installed and a complete set of checking devices provided. On the latter all cases are fitted before shipment and the Chillingworth company feels that it now has one of the most modern and best-equipped gear case factories in the country.

The process of drawing a single sheet of soft steel in the shape of a gear case half has been in use by the company for several years, but it has recently incorporated into this process modern methods of heat treating the steel after it has been drawn into shape. This modification of the process has met with the approval of experts conversant with the best practice for annealing steel. The chief object of this annealing process is to insure a structure of the steel that is particularly required in gear case service, which demands a soft, pliable and tough material.

An invitation has been extended by the Chillingworth company to any users of gear cases who would be interested in observing the manufacture of drawn steel cases.

B.-M. T. Will Purchase 50 Triplex Articulated Cars

New York Rapid Transit Corporation Charges that the City Has Failed to Comply with Its Obligations to the Company in Withholding Construction of Additional Subway Lines and the Coney Island Shops

WHEN the New York Transit Commission met on Dec. 21 to conduct a hearing on the proposed order to force the purchase of 50 new steel cars by the Brooklyn-Manhattan Transit Corporation it was learned that the need for the hearing had been obviated. W. S. Menden, president of the New York Rapid Transit Corporation, subway-operating subsidiary of the B.-M.T., announced that the company would accept the commission's direction and purchase the cars in the form of 50 triplex units, similar to the articulated equipment now in experimental use on the lines.

Yet all was not smooth upon the surface of this acceptance. Mr. Menden, in a letter to the commission, charged that the city had flagrantly disregarded its agreements which had been definitely contracted for with the company and had failed to construct the Nassau Street subway, complete the Fourteenth Street-Eastern District subway or to supply shops within a reasonable period after the signing of the contract. He declared that the Coney Island shops, which are under construction, were still uncompleted fourteen years after the signing of the contract. He also said because of the lack of shop facilities the company now was forced to keep on freight cars equipment for 67 triplex cars previously purchased by order of the commission, at an expense of \$100 a day for demurrage.

SOME WOODEN CARS WILL BE REPLACED BY EARLIER ORDER OF EQUIPMENT

In spite of the fact that the city, co-partner with the rapid transit company in all new construction work, has allegedly failed to meet its obligations, the B.-M.T. agrees that the new cars will be obtained at the earliest possible date and will further serve to eliminate the unsafe wooden cars now in operation. This replacement program will be given considerable impetus by the group of 67 articulated units which were ordered some time ago and which are now awaiting assembling in the Coney Island shops. The Transit Commission has repeatedly avowed its intention to do away with the operation of wooden cars just as rapidly as new steel equipment may be obtained. However, the commission has called the attention of the public to the fact that wooden cars are of necessity used on the various bridge lines of the B.-M.T. where the structures are not strong enough to permit the operation of steel cars.

Mortimer B. Hoffman, counsel for the B.-M.T., announced that half of the new order would be ready for assembly at the shops as soon as assembling work on the 67 units ordered at the direction of the commission nearly a year ago is completed. This is expected

to be in June, at the latest. He stated that the second half of the order now to be placed should be completed by Dec. 31, 1927.

Power Show Exceeds All Past Records

Attendance at the fifth National Exposition of Power and Mechanical Engineering reached the hundred thousand mark. The exposition was held, as usual, in the Grand Central Palace, New York City, the date this year being Dec. 6 to 11, inclusive, and considerably exceeded similar functions in the past in the magnitude and variety of materials exhibited.

Four hundred and ninety manufacturing firms were represented on the four floors of the building and the exhibit covered practically every phase of the power generating and mechanical engineering fields. A considerable

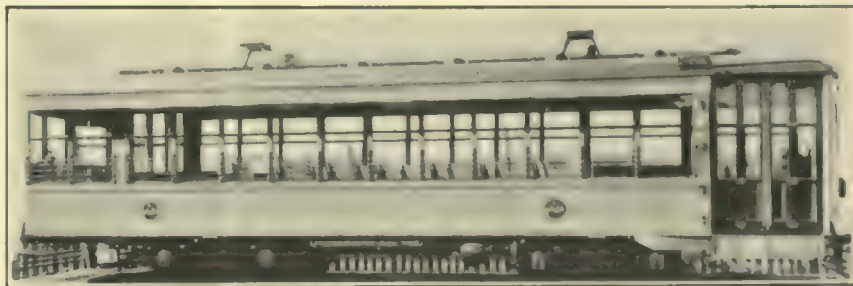
improvement was noted in the methods used by exhibitors in displaying their apparatus.

The tremendous influence that welding is having on all types of mechanical equipment was shown by a large number of exhibits of the various types of welding equipment and by a very large number of products manufactured by the welding process.

Many new types of furnaces and boilers were shown. Problems of valve operation were well illustrated and the use of stainless steel trimmings and monel metal trimmings in this field was featured by a large number of exhibitors. Machine tools and various types of shop equipment were amply displayed and the most improved methods for heating, illuminating and ventilating shops and factories were outlined.

Plans are already under way for the holding of the sixth Power Show from Dec. 5 to 10, 1927. The advisory committee which assisted the management in the conduct of the 1926 exhibition consisted of I. E. Moulthrop, chairman; W. L. Abbott, Homer Addams, N. A. Carle, W. H. Driscoll, Fred Felderman, C. F. Hirshfeld, O. P. Hood, L. H. Jenks, E. B. Katte, R. T. Kent, John H. Lawrence, Fred R. Low, David Moffatt Myers, R. F. Pack, Fred W. Payne, H. B. Reynolds, Calvin W. Rice and Charles F. Roth.

One of Eight New Street Cars Now Operating in St. Petersburg, Fla.



The Municipal Railway received its new rolling stock in November and has recently placed the units in regular service. They were built by the

American Car Company of St. Louis, Mo., and the principal specifications appeared in the *ELECTRIC RAILWAY JOURNAL* Dec. 4, page 1032.

Simplified Classification of Scrap

Tentatively Adopted Specifications for Iron and Steel Scrap Now Available in Pamphlet Form

Of real value to railways having quantities of iron and steel scrap to dispose of will be the specifications for different classes of scrap which have just been issued by the National Committee on Metals Utilization in its report to the Bureau of Standards of the United States Department of Commerce. The general campaign for elimination of industrial waste has been carried on for four years by the Division of Simplified Practice of the Department of Commerce, and this particular phase of the work, the simplification of scrap classification, was undertaken about three years ago. Formerly, as stated in the pamphlet just issued, iron and steel scrap has been bought and sold under different classifications which were drawn up to meet the convenience of individual interests, which compelled the dealer to use different classifications to meet the requirements of his various customers. Similarly, when buying scrap the dealer was forced to accept his material according to the classifications under which it was sold to him. This condition caused unnecessary confusion and attendant misunderstanding and loss.

At the present time all classes of scrap have been gathered together into a number of general categories which are designated according to the uses for which they are intended. For example, there are the classes of scrap which will be used in blast furnaces, those intended for use in basic open-hearth furnaces, those for use in acid open-hearth furnaces, those for electric furnaces, for gray iron foundry practice, etc. As an example of the specification for scrap under each general classification, the category for use in blast furnaces consists in part of the following:

1. Pipe busheling scrap—Iron and steel pipe and flues (clean), bedstead tubing and similar material cut 8 in. and under in length, free from galvanneal material and foreign metals.

2. Mixed borings and turnings—Clean, short steel and wrought iron turnings, drillings, screw cuttings and cast or malleable iron borings and drillings, free from stringy, bushy, tangled, corroded material, lumps, excessive oil, scale, other metals, dirt or foreign material of any kind. Alloy steel scrap may be excluded from these specifications by mutual agreement between buyer and seller.

Included in the pamphlet is a standard contract form for the purchase of scrap which was drawn up at the instigation of the National Association of Purchasing Agents.

These iron and steel scrap classifications have been accepted by the American Electric Railway Association and many other associations and by a large number of individual manufacturing companies. They have been accepted in "principle" by various associations, trade journals, technical societies and

organizations approving of the general purpose and program of waste elimination. Among these is the ELECTRIC RAILWAY JOURNAL.

Copies of the pamphlet may be obtained from the superintendent of documents, Government Printing Office, Washington, D. C., at a cost of 10 cents each. Checks or money orders should be drawn in favor of the above-named official. Specifications and the standardized contract form for the purchase of scrap have been adopted for a period of one year, at the end of which time a revision conference will discuss and, if found desirable, modify the classifications. Suggestions and criticisms should be referred to the committee on iron and steel of the National Association of Purchasing Agents, of which H. C. Wickline, Union Steel Casting Company, Pittsburgh, Pa., is chairman.

Union Carbide Elects Two New Officers

W. F. Barrett has been elected to a vice-presidency of the Union Carbide & Carbon Corporation and G. W. Mead was made a director of the company at a meeting of the board of directors in New York on Nov. 23. Mr. Barrett began his association with the Union Carbide & Carbon Corporation in August, 1913, when he became works manager and chief engineer of the Linde Air Products Company, a subsidiary of the parent corporation. Mr. Mead has been identified with the company and its subsidiaries since 1906, when he was elected as the first secretary of the Union Carbide Company. Both of the officials have held many important positions with the Union Carbide & Carbon Corporation and its various subsidiaries and are at present officers and members of the boards of a large number of the companies.

Duluth and Indianapolis Will Use Johnson Fare Boxes

The Duluth Street Railway and the Indianapolis Street Railway have ordered 110 and 370 type D Johnson fare boxes respectively and will place these on all cars. These boxes register pennies, nickels, dimes and ticket tokens. They have two registering dials, one for cash fares and one for metal token ticket fares.

Metal, Coal and Material Prices

Metals—New York	Dec. 21, 1926
Copper, electrolytic, cents per lb.	13.35
Copper wire, cents per lb.	15.75
Lead, cents per lb.	7.80
Zinc, cents per lb.	7.47
Tin, Straits, cents per lb.	68.00
Bituminous coal, f.o.b. Mines	
Smokeless mine run, f.o.b. vessel, Hampton Roads, gross tons	\$5.325
Somerset mine run, Boston, net tons	2.75
Pittsburgh mine run, Pittsburgh, net tons	1.25
Franklin, Ill., screenings, Chicago, net tons	1.75
Central, Ill., screenings, Chicago, net tons	1.375
Kansas screenings, Kansas City, net tons	2.30
Materials	
Rubber-covered wire, N. Y., No. 14, per 1,000 ft.	\$6.00
Weatherproof wire base, N. Y., cents per lb.	17.50
Cement, Chicago net prices, without bags	2.10
Lined oil, (5-bbl. lots), N. Y., cents per lb.	11.3
White lead in oil (100-lb. keg), N. Y., cents per lb.	14.75
Turpentine (bbl. lots), N. Y., per gal.	\$0.89

Rolling Stock

Toledo, Ohio.—Several of the newly remodeled cars of the 700 type have recently made their appearance on various lines of the Community Traction Company over which one-man cars are in operation. The modernized equipment has leather upholstery, new trucks, various provisions for eliminating noise and complete one-man safety devices. A large number of cars are to be similarly rebuilt in the general program of rehabilitation which the Community Traction Company has undertaken. The new arch-deck roof is a feature of the model cars. The work is being carried on at the Central Avenue carhouse in Toledo.

Track and Line

Memphis Street Railway, Memphis, Tenn., has started work on the extension of the Central-Poplar car line from Tucker Street to Florence Street. The extension, which is to cost \$23,000, is to provide turn-back facilities on the Central-Poplar line that one-man cars may be installed. Work will be completed in about 60 days.

Tri City Railway, Davenport, Iowa., is erecting 1½ miles of new trolley line. This improvement will entail a total expenditure of \$3,000 or more.

Trade Notes

J. M. Van Nieuwerkerken recently joined the American Brown Boveri Electric Corporation at the Camden, N. J., plant as a railroad project engineer. Mr. Van Nieuwerkerken is a graduate of the Delft Technical University in electrical engineering and was previously connected with General Electric Company, Ltd., Birmingham, England; British Westinghouse Electric & Manufacturing Company, Ltd., Manchester, England; Westinghouse Electric & Manufacturing Company, East Pittsburgh, Pa., and the Cleveland Union Terminal Company, Cleveland, Ohio.

Baltimore, Md.—A corporation is being organized to authorize the manufacture and sale of several new types of car parts. Featured in the line will be the Suarez universal joint coupler, designed especially for articulated cars.

A. W. Scarratt has been appointed assistant chief engineer of the Hyatt Roller Bearing Company, Newark, N. J. Mr. Scarratt is well known in engineering circles through long association with the electric railway and power house engineering fields, as well as with tractor and power farm implement development. He was for many years with the Minneapolis Steel & Machinery Company, and before that spent eight years with the Twin City Rapid Transit Company, five years in the mechanical department and three in power house and electrical development work. Mr. Scarratt still retains the office of secretary of the Minneapolis Section of the Society of Automotive Engineers.



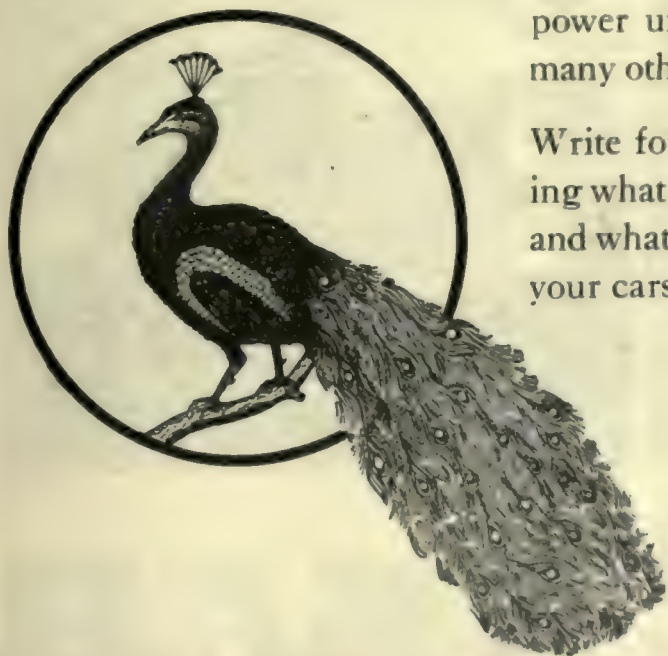
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Mr. E. A. Blake, President of Interstate Stages, Inc., writes that his line has found that equipment in Goodyear Balloon Bus Tires. Mr. Blake's letter reads as follows:

"We have received numerous unsolicited testimonials from people who have enjoyed the riding qualities of Goodyear Balloon Bus Tires, which are standard equipment on all our Fageol Safety Stages, operating daily between Detroit and Chicago, a distance of 280 miles.

"This type of tire has more than met our expectations and is giving wonderful service and freedom from tire failures en route.

"This, in conjunction with their sure-footedness on slippery roads, combined with our air brakes, has earned us the reputation of being the safest and most dependable motor transportation service between these two points."

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You can always depend on Goodyear Tires for active, tractive, economical service on any road.

They are durable. They cushion. And they cost less per tire mile.

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And the tongue shows "I'm-pretty-well-thank-you."

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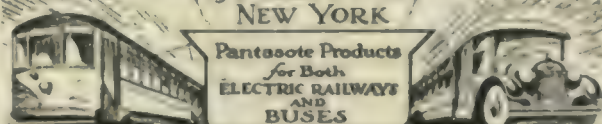
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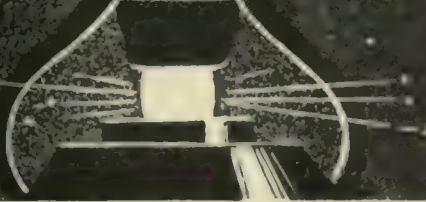
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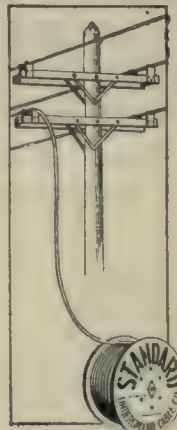
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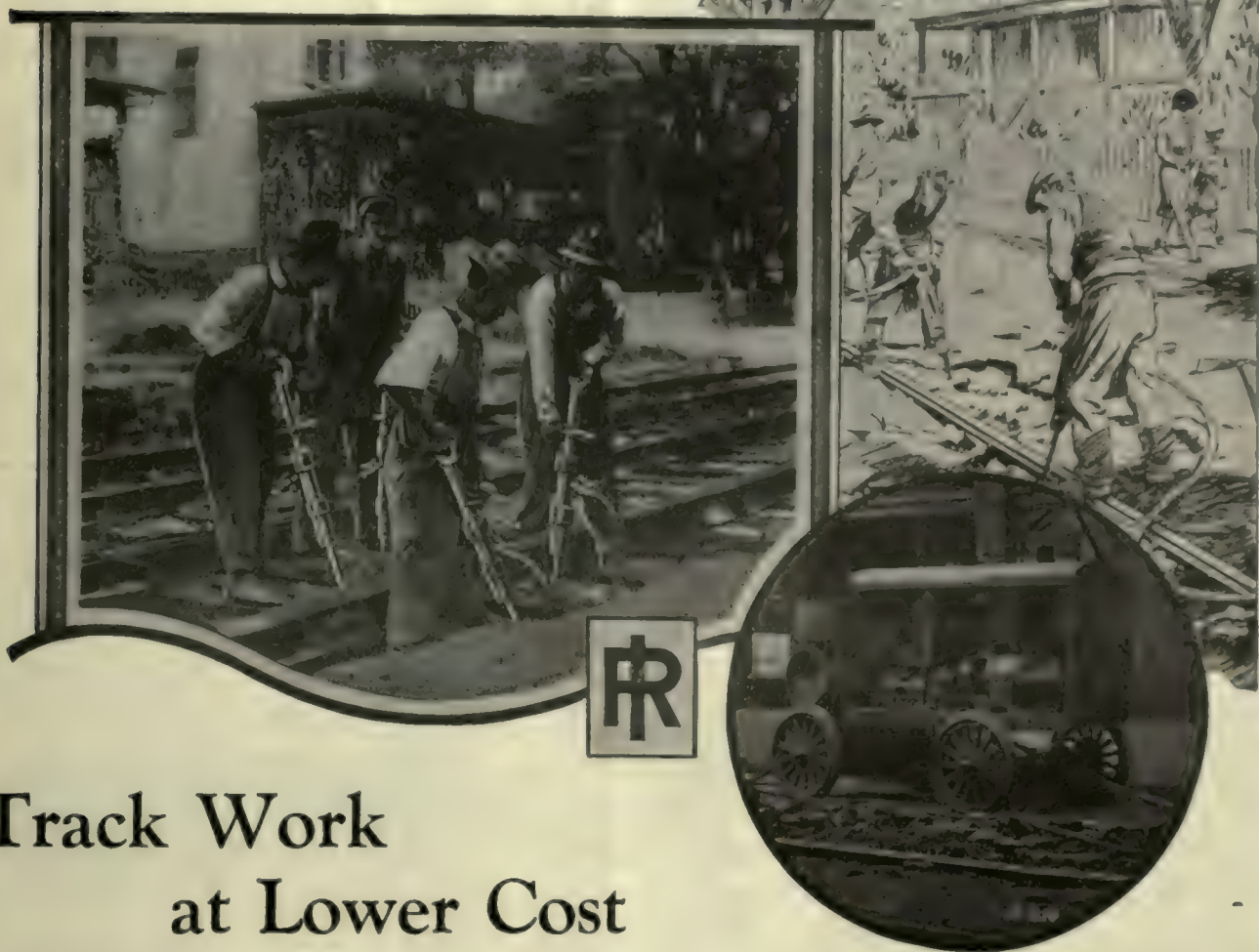
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(Continued on page 28)

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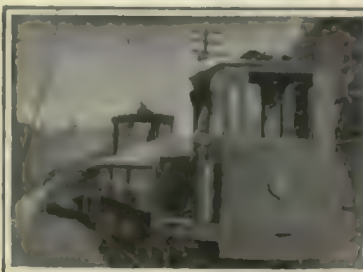
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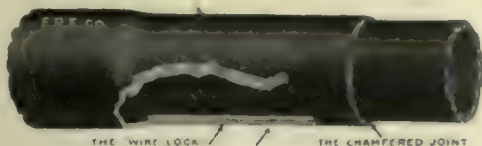
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Maintenance of Equipment.....	3.09	3.25
Power	8.15	6.72
Conducting Transportation.....	14.92	10.40
Traffic		
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